NETWORK WORLD
THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING
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Royal Bank balances pluses, minuses of IBM's FlowMark

BY KEVIN FOGARTY

Toronto

Royal Bank thinks work flow software could help it automate business processes and cut product development time, but after testing a beta copy of IBM's initial work flow offering, the bank isn't ready to invest in it just yet.

IBM's FlowMark has the potential to help Royal Bank streamline its mortgage approval and credit application cycles, said Mike Velshi, vice president of technical planning and development for the bank. But the software sucked up too much processing power and lacked the stability and net support needed to persuade Velshi to implement it in a big way any time soon.

"[FlowMark] has great potential, but I think it's still quite embryonic," he said. "I'm not too sure about how stable it is and how it could perform on a large LAN, for example. We'll probably watch how some other big users implement it before we decide to go in for something like that."

IBM worked closely with Royal Bank and claims to have addressed many of the user's concerns in the first

See **Royal**, *page 81*

JOHN HARQUAIL

Royal Bank's Geoff Lancaster (l.) and Mike Velshi see lots of promise in work flow software, but they aren't yet ready to fund a big implementation of the technology.

IBM to reinforce NetView

Big Blue to add automation features to host-based version, issue new releases of LAN NetView and NetView/6000 systems.

BY MICHAEL COONEY

Raleigh, N.C.

During the next few months, IBM will add a variety of tools to its NetView arsenal aimed at taming the distributed network management beast.

The IBM plans call for enhancements to host-based NetView that will add new automation facilities and help it better handle distributed local-area networks. There will also be new versions of LAN NetView and NetView/6000 that promise improved performance, database management and discovery services.

IBM executives detailed the plans here last week at the first meeting of the NetView/6000 Association.

"Over the next four years, users will spend about $25 billion on network management platforms, and the majority of that will be on tools for managing distributed enterprises," said Bill Warner, IBM's director of network management. "We are going to enable the NetView family to manage large multivendor distributed networks from whatever platform users want to use."

IBM will begin its assault this month by shipping NetView Multisystem Manager/MVS, a tool that automatically gathers topology and status information and stores it in the Resource Object Data Manager (RODM) on the mainframe. RODM is IBM's object-oriented database used to store network management information.

Originally, IBM said the Multisystem Manager could gather data only from LAN Network Manager and Novell, Inc. NetWare LANs. Last week, the company said it will also be able to collect data from

See **NetView**, *page 80*

Sons of NetView

BY JIM DUFFY

Can SNA management be downsized from a mainframe to SNMP management stations? Depends on whom you believe.

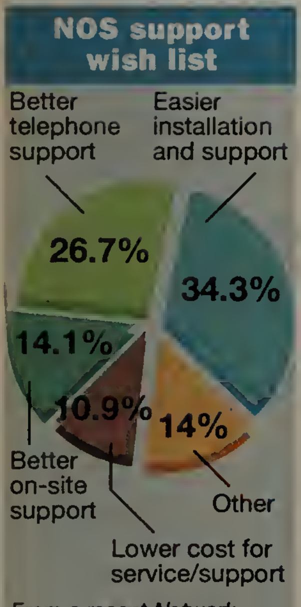
Proponents say NetView alternatives from a variety of vendors will soon match IBM's mainframe-based management system task-for-task. The products promise to help users integrate management of Systems Network Architecture and LAN internetworks on a single graphical console and free up mainframe cycles for other applications.

And today's Reduced Instruction Set Computing-based workstations have more than enough horsepower to run a NetView-like system, proponents say.

See **Debate**, *page 80*

LAN-based NetView alternatives

Pros	*Cons*
◆ Can manage SNA and SNMP devices from a single console with a graphical user interface.	◆ User must rewrite scripts, automation routines and other NetView functions.
◆ Preserves mainframe cycles for application processing.	◆ Investment retention in NetView is nullified.
◆ Costs less and is simpler to configure and use.	◆ Staff must be retrained on SNMP platform or for other responsibilities.



From a recent *Network World*/Dataquest survey in which 64 users were asked to identify service and support areas their NOS vendors needed to improve.

Novell zeros in on enterprise support

BY CARYN GILLOOLY

Summit, N.J.

Novell, Inc. next week is expected to announce a new Enterprise Solutions Division that will provide large customers and integrators with the service and support they need to implement the company's high-end products.

Novell will also announce enhancements to its developer service offerings intended to show corporate and independent software developers how to get the most out of its enterprise-level products — mainly NetWare 4.

"This new division is really a catalyst for change in all of Novell to address enterprise issues," said Andy Huffman, the Novell vice president who will be head-

See **Novell**, *page 6*

NEWSPAPER
001

FRAME RELAY

AT&T commits to upgrade InterSpan net

BY JOANIE WEXLER

Basking Ridge, N.J.

An outpouring of demand for frame relay services has sent AT&T scurrying to reengineer its InterSpan network and pump up capacity.

The carrier has suspended service for some frame relay customers and is warning new users that they might have to wait to receive guarantees for the committed information rates (CIR) they request, according to InterSpan customers and AT&T.

The carrier is rushing to install a large number of StrataCom, Inc. IPX frame relay edge switches in both existing and new territories, an AT&T spokeswoman confirmed last week. While she would not give the exact number, sources close to the company estimated that 40 to 60 more IPX switches will be in place by the end of next month.

AT&T declined to state how many switches make up its frame relay network today. But Kevin Brand, AT&T InterSpan frame relay product manager, acknowledged: "We are expanding our network dramatically. We are only just keeping up with demand now."

Jeff Smith sees it differently.

"The current AT&T network is overbooked," said Smith, communications engineer at systems integrator and outsourcing firm Perot Systems, Inc. in Dallas,

See **InterSpan**, *page 81*

PAGE TWO

Briefs

Fore! Look out for low-cost ATM. The high price of Asynchronous Transfer Mode (ATM) is one of the main reasons users cite for holding off on the technology. But Fore Systems, Inc. will break through the $1,000 price barrier when it drops the cost of its SBA-100 fiber-optic ATM adapter card from $2,495 to $995. Fore will announce an average across-the-board price reduction of 48% for the rest of its ATM adapter cards.

Faster, faster, faster. Bear, Stearns & Company, Inc. is bullish on Synchronous Optical Network (SONET) technology. The brokerage firm and its fast-packet partner MFS Communications Company, Inc. have built a private SONET-based adjunct net to the nationwide ATM service that Bear, Stearns uses from MFS. The 2.5G bit/sec SONET system runs through five counties in New York and New Jersey, carrying Asynchronous Transfer Mode loads throughout Bear, Stearns' heaviest volume areas.

Command-ing attention. At the NetWorld + Interop 94 trade show in Las Vegas next month, ISICAD, Inc. will demonstrate a new Command software module that traces virtual circuit connections through wide-area networks. The software will allow users to document WAN bandwidth allocation and equipment, as well as end-to-end enterprise network topology. It is expected to be available in the third quarter.

Cooperating with Oracle. Oracle Corp. doesn't want you to run out of things to do with your Oracle databases. So the company today will announce a new suite of client/server-based database applications optimized to run in a massively parallel processing environment. Oracle Cooperative Applications Release 10 consists of new application modules for commercial accounting, manufacturing, distribution, human resources, government accounting and project control. Pricing and availability information could not be acquired.

SQL database access: the sequel. The SQL Access Group last week said it will develop a transport-independent remote database access specification. It will be based on existing Open Systems Interconnection-based database access technology but will extend remote access to Transmission Control Protocol/Internet Protocol nets, among others.

On the way at EMA. Control Data Systems, Inc. will announce at the Electronic Messaging '94 conference in Anaheim, Calif., this week the addition of IBM RISC System/6000 and Hewlett-Packard Co. HP 9000 versions of its Mail-Hub electronic messaging backbone server software. The company will also announce Mail-Hub gateways for Lotus Development Corp. Notes, Novell, Inc. Message Handling Service (MHS) and IBM Systems Network Architecture Distribution Services.

Meanwhile, GE Information Services (GEIS) this week will announce support for electronic data interchange over X.400. GEIS' X.435 program will start by midyear.

OracleWare, UnixWare get hitched. If it's good enough for NetWare, then it's good enough for UnixWare, according to Novell, Inc. The leading local-area network vendor last week joined Oracle Corp. in announcing the release of OracleWare System-UnixWare Edition 1.0. The new offering is a conglomoration of Novell's UnixWare Application Server 1.1 and the Oracle7 database management system, as well as a collection of other Oracle products. The integrated package lets administrators install all software from the same UnixWare console. A five-user license is available for $5,095. For more information, call (800) 633-0643, Ext. 15.

SNET to go the distance. In another coup for competition, Southern New England Telecommunications Corp. said it has received regulatory approval to offer combined intrastate, interstate and international long-distance telephone service. SNET now provides local exchange services.

Contacts

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NETWORK WORLD SHORT LIST 1994

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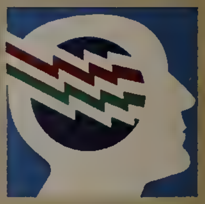

Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.*

PROBLEM SOLVED

Alan Warren of Weatherford, Texas, dropped us a note saying that he just unexpectedly received a package from Central Point Software, Inc. containing a free upgrade of XtreeNet Version 3.

In our March 7 Help Desk, we reported that Warren needed a patch for a security loophole he found in XtreeNet Version 2.07, a network and file management utility for Novell, Inc. NetWare local-area networks. *NW* contacted a Central Point spokesman on Warren's behalf and found that his only option was to upgrade to Version 3 at an extra cost of $149 per server.

It's nice to see that Central Point rethought its policy for Warren, who was concerned about resolving the situation in time for a planned April security audit at his company.

I am looking for sources of information to help me plan or strategize disaster recovery in a local-area network environment. I would prefer sources that provide a cookbook approach or a checklist to help in the strategizing.

Joel Cort, Lockport, N.Y.

Mark Hayes, a network administrator in Atlanta is currently working with his company's MIS department to develop a comprehensive disaster recovery plan for their entire operation. Hayes recommends two books that have helped his company implement its program.

Hayes first recommends *Disaster Recovery Planning* by Jon William Toigo (Yourdon Press Computing). This book contains complete, technical text as well as two, large foldouts of planning charts in the book's appendices.

The "Master Emergency Decision Making Flowchart" is a combination of all the book's individual flowcharts and is useful when creating the skeleton for an entire disaster recovery plan.

The second chart, the "Master Data Flow

See **Help desk,** *page 61*

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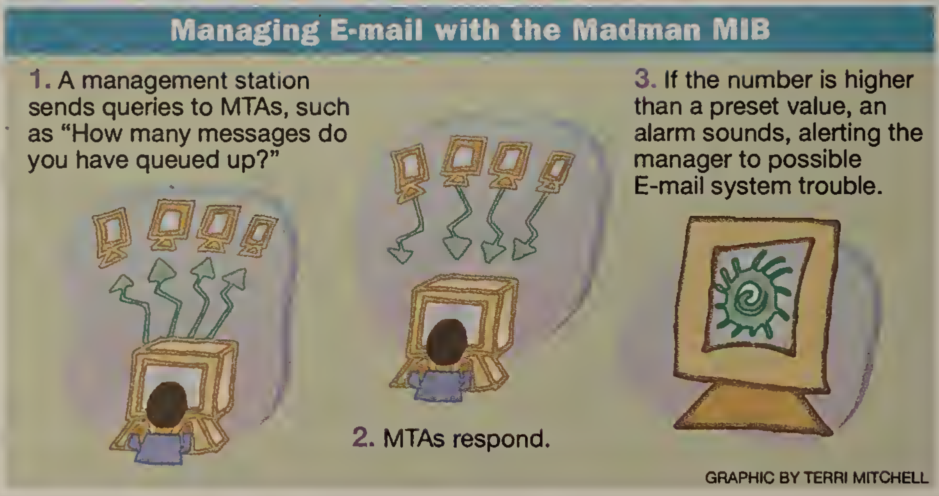
Diary of a Madman: managing E-mail nets

BY ADAM GAFFIN

SNMP management tools now used to gauge the health of networks could be extended to electronic mail monitoring under a series of draft specifications developed by the Internet Engineering Task Force (IETF).

An IETF working group has proposed standards that could be used to build Simple Network Management Protocol Management Information Bases (MIB) that would let SNMP-based management platforms monitor the health of an E-mail backbone.


Managing E-mail with the Madman MIB

1. A management station sends queries to MTAs, such as "How many messages do you have queued up?"
2. MTAs respond.
3. If the number is higher than a preset value, an alarm sounds, alerting the manager to possible E-mail system trouble.

GRAPHIC BY TERRI MITCHELL

The Mail and Directory Management MIB, or Madman, would let an administrator watch the status of message flows by periodically polling message transfer agents (MTA), according to Ned Freed, a coauthor of the two requests for comment (RFC) that define the proposed MIB. MTAs route messages across an enterprise mail net.

At the most basic level, an SNMP management tool could determine whether a remote MTA is operational. Additional objects defined in the MIB would let a manager see how many messages are queued in an MTA, either by number or by total size in kilobytes, and any other information the MTA is equipped to provide.

The RFCs were released in January. Typically, Internet RFCs undergo six months of scrutiny and comment before being released in final form.

At least two companies that provide SNMP management tools, Hewlett-Packard Co. and SunConnect, are already looking at ways of building Madman MIBs.

"They're on the right track," SunConnect spokesman Bill Jeppesen said.

Some E-mail vendors have incorporated SNMP support into their routing software or committed to do so. Control Data Systems, Inc.'s routers support SNMP, for example, while Lotus Development Corp. said it will incorporate SNMP into the Lotus Communications Server planned for early 1995.

But the MIB will provide at least some level of management for any E-mail system, and vendors will be able to add MIB extensions that address their specific products.

Innosoft International, Inc. of West Covina, Calif., is already working to add the MIB to its line of message routing software, said Freed, chief development officer at the company. He emphasized that the message MIB would only form a part of an overall E-mail management system. The Madman RFCs, for example, do not address how to manage message stores or E-mail gateways.

Freed said the working group limited its scope on purpose, feeling that if it tried to develop an overall solution, it would never finish anything.

Still, getting warnings of messages jamming up in an MTA could represent a dramatic improvement over the situation at many companies today, where administrators learn of problems only when users begin complaining, sometimes after thousands of messages have gotten stuck in a single router, Freed said.

Mike Corujo, a senior systems engineer at the Department of Energy in Germantown, Md., said a mail MIB would be a vital first step to taming enterprise mail management woes. He helps oversee a net linking 95,000 end users across the country who employ a variety of E-mail systems over internal and public X.400 and Simple Mail Transfer Protocol connections.

When the MIB is released, Corujo predicted vendors will quickly work to add extensions. "Once they open that Pandora's box, it's just going to explode," he said. ◘

MCI says its nationwide ATM service still a way off

BY BILL BURCH

San Francisco

Although users might like to see MCI Communications Corp. offer a national Asynchronous Transfer Mode (ATM) service, current equipment is not up to the challenge of supporting a public ATM offering, Vinton Cerf, MCI senior vice president of data architecture said here last week.

While Cerf raised several good points, it was not clear how much of his comments were driven by competitive posturing. MCI is the last of the big three carriers to spell out ATM plans. Sprint's ATM service is up and running and AT&T, which makes its own equipment, is scheduled to begin the controlled introduction of a service this quarter. Carriers WilTel and MFS Datanet already offer ATM service on a national basis.

But Cerf told an audience of users and vendors at a conference, ATM: Year Two, that MCI has tested equipment from a number of vendors in its lab in Richardson, Texas, and has found ATM technology still too immature to support a full-fledged service.

"ATM service should be provided to the customer when we can provide a high-quality of service that the customers can rely on and which can be built in expectation of very large scaling," Cerf said.

With current ATM equipment designed for private networks, the switches do not meet public network's operational requirments, Cerf said. For example, current switches can only provide as many as 32 ports, but MCI will need to support thousands of ports, he said. Also, current switches cannot handle such functions as order entry, configuration, accounting and billing, Cerf said.

MCI has been testing vendors' equipment over the last nine months on a five-node national network. Equipment tested has included the Magellan Gateway switch from Northern Telecom, Inc., according to industry sources.

That switch may prove to be too limited for MCI's network needs. Intended for mid-sized networks, the Magellan can only support 24 DS-3 ports per chassis and has a top speed of 1.2G bits/sec.

Because of the Magellan limitations, MCI is reportedly considering the CPS 100 cell packet switch from Loral Data Systems in Sarasota, Fla.

The Loral switch's top speed of 5G bit/sec could be closer to MCI's needs. Several other network service providers are looking at the switch as well, according to a company spokesman for ADC Telecommunications, Inc. in Minneapolis, which markets the switch.

MCI's tests to date have revealed that larger may be better in guaranteeing network performance, according to David McDyson, a member of MCI's executive staff. In particular, the carrier has found that large buffers can help guarantee throughput. Buffer size must rise to nearly 5,000 cells before carriers can expect throughput of 90% on Transmission Control Protocol traffic sent over ATM.

Overall, MCI's need for high backplane speeds and large buffers is beyond most vendors' current designs, and progress will be needed in such areas as congestion control as well, Cerf said.

"There's endless debate about the way in which congestion control should work," Cerf said.

Although users might consider switched virtual circuits (SVC) to be a nicety that could be added to ATM networks at a later time, that capability is a necessity for MCI, Cerf said. The carrier does not want to have a squad of engineers dealing with thousands of permanent virtual circuit changes every day in order to configure customers' networks, he said.

When it does launch an ATM service, MCI's goal is to leapfrog current offerings with a technologically superior service.

But looking at current standards progress, MCI likely will not have a native-mode ATM offering for customers until well into next year or later. For example, SVCs do not look possible until 1995, MCI's McDyson said. ◘

TGV to enter PC arena with TCP/IP stack

BY JIM DUFFY

Santa Cruz, Calif.

TGV Corp. will soon take on the likes of Microsoft Corp., Novell, Inc., The Wollongong Group, Inc., FTP Software, Inc. and NetManage, Inc. when it unveils a TCP/IP stack for Windows workstations. But it may not stop there.

The $20 million-plus Transmission Control Protocol/Internet Protocol software maker that created a business of rescuing Digital Equipment Corp. users from DECnet/OSI, is also sizing up the Unix and IBM Application System/400 markets and keeping an eye on the progress of Windows NT.

PREVIEW
NETWORLD + INTEROP 94

How will TGV, the largest independent provider of TCP/IP for Digital's VMS operating system, fare against these personal computer heavyweights? Very well, thank you, said Craig Conway, company president and chief executive officer.

"We come to the marketplace as the industrial-strength TCP/IP vendor," Conway said. "MultiNet [TGV's flagship product] was the first TCP/IP capability for VAX. It's a tried-and-true product, exercised on an enterprisewide basis for many, many years."

The firm will demonstrate its new baby, MultiNet for Windows, in two weeks at NetWorld + Interop 94 in Las Vegas. MultiNet for Windows will feature the same TCP/IP stack that's used in the VMS product, though fitted with a Virtual Device Driver (VxD).

VxD is a 32-bit multiplexing device driver that manages data exchanges between Windows applications and system services. Other TCP/IP products for PCs use less robust terminate-and-stay-resident (TSR) programs and Dynamic Link Libraries.

"Everything you expected to see on VMS is now available under Windows with similar performance," said David Kashtan, chairman and cofounder of TGV. "The architecture is different, as we wanted to make it more portable but similar enough that the migration of the code is straightforward."

CONWAY

TGV plans to port all of the functionality of MultiNet for VMS over to the Windows product and provide application program interfaces so users can build in file systems and other higher level functions. This type of portability will also be useful should TGV decide to make a run at the Unix, AS/400 and Windows NT markets.

Kashtan claims that MultiNet for Windows, when used with a 66-MHz Intel Corp. i486 platform, can saturate a 10M bit/sec Ethernet and run virtually unnoticed by Windows users.

According to analysts, TGV will need that type of performance, as well as a VxD implementation, to compete in the PC arena. "They're going to need the credibility as they enter into a market they haven't traditionally played in," said Jim Harrison, a vice president at the META Group, Inc. in Westport, Conn.

Does this mean the VMS market has been tapped out? Hardly, Conway said. "Deployment of TCP/IP on VAXes is still in its infancy," he said. "Five hundred thousand of the 600,000 VAXes out there still do not have TCP/IP. It's really a good market for us."

MultiNet for Windows will be available in the third quarter for around $400.

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ELECTRONIC COMMERCE

DOD goes on the offense with two EDI hubs

BY ELLEN MESSMER

Washington, D.C.

The Department of Defense has quietly begun building two electronic data interchange hubs that will serve as central contact points for suppliers looking to do business with the military.

The hubs, which will be located at military installations in Ogden, Utah, and Columbus, Ohio, and attached to EDI gateways operated by the Air Force and Army, will give value-added network (VAN) customers a way to reach military bases in the U.S.

"This will not only be for electronic purchasing, but for all EDI applications, such as financing and warehousing," said Michael Green, Electronic Commerce/EDI integration manager with the Defense Information Systems Agency (DISA) in Columbus.

According to plans outlined in a DISA document, "Distribution Hub Infrastructure," the Defense Department intends to make EDI a standard way of doing business within the three years to speed procurements and make them more competitive.

Green said 14 VANs, including Harbinger EDI, MCI Communications Corp. and GE Information Services, have signed VAN connection agreements. Four of these VANs are testing their links to the hubs.

"The government has finally decided to get into EDI in a big way," said Martha Hanlon, director of electronic commerce product management and marketing at MCI. "They want to do it in a way that provides universal access for VANs and suppliers."

DISA, which is managing the EDI hubs at Hill Air Force Base in Ogden and the Defense Logistics Agency data processing center in Columbus, said the hub system will give all VANs equal opportunity to provide EDI service to end users as the government moves to electronic commerce (*NW,* April 11, page 1).

The first operational transactions through the hubs are expected to occur next month.

The Department of Defense EDI hubs will archive all transactions passing across them, and the department will use the ANSI 997 standard for acknowledgment of delivery and translation of all EDI messages.

DISA is offering VANs three ways to connect to the hubs. Accredited VANs can set up a toll-free number that the hubs will dial in to periodically to exchange transactions. Or VANs can install a dedicated circuit — minimum 19.2K bit/sec speed — to a Defense Department distribution hub.

Thirdly, VANs can set up an Internet mailbox to get mail from the Transmission Control Protocol/Internet Protocol-based Defense Data Network.

FUTURE DIRECTION

But the Defense Department hub connectivity options are likely to change over time. The department wants to fulfill the Government Open Systems Interconnection Profile mandate and eventually use File Transfer, Access and Management to send EDI data. In addition, the Defense Department would prefer to use X.435 for sending ANSI X12 EDI messages packaged in 1988 X.400 envelopes.

But the military's lack of an installed X.400 infrastructure makes immediate use of X.435 impossible. "We ourselves can't handle X.400," said DISA technician Green. "We can't generate an X.400 envelope."

The military's Defense Messaging System contract to be awarded this December is viewed as the means for bringing 1988 X.400 to military users' desktops. ◘

Novell

Continued from page 1

ing up the group. "We're working with each product group to help deal with their enterprise issues."

It's about time, according to Jeff Kaplan, a director at the Worldwide Services Group of Dataquest, Inc., a research and consulting firm in Framingham, Mass.

"With the higher functionality [Novell's] trying to achieve with NetWare 4 . . . [the company] should be playing a more prominent role in consulting with customers on how to implement its products," he said.

Users agreed. "Novell has definitely not provided service and support on an enterprise level," said Robin McCubbin, senior network planning analyst at National Grocers Co., a NetWare 4 user in Toronto.

"On one end, the reseller you buy the product from doesn't have the experience to sit down and give you what-if scenarios that are important before you put the product in," he explained. "And once you've got NetWare 4 up and running, if you hit a problem, where do you go?"

Half of Novell's answer to that question is its Enterprise Solutions Division.

"We've formed this division to focus on the issues companies face as they rightsize to multivendor client/server distributed products," Huffman said. "Customers have asked us for help as to how to go about rightsizing. This is aimed at the front end of the solutions life cycle — at providing information, education and support to [customers and systems integrators] who are doing the up-front development."

The division will provide this support through a series of partnerships with consultants, integrators and high-end resellers that specialize in this type of planning, he added. The division will be open for business when it is announced next week.

To address the back end, once the products are installed, Novell's service and support group will announce new pricing, training and support options.

"We're going to beef up our developer support offerings, focusing on both [independent software vendors] and corporate developers," said Jan Newman, executive vice president of service and support at Novell, whose group will be rolling out the new developer-focused options.

Although he would not provide further specifics, Newman said these offerings, like the new division, will also focus on strengthening partnerships with third parties to better help customers.

CUTTING THE MUSTARD

Some of Novell's highest end customers do not need its service and support.

For example, Chuck Rush, manager of network computing at McDonald's Corp., a NetWare user based in Oakbrook, Ill., explained that his firm does all its own configuration planning, installation and support in-house — they are not at all dependent on Novell or a Novell reseller.

But McDonald's is in the minority. Others stressed the importance of this support since NetWare 4 is in place and hope the new programs can cut the mustard.

"With NetWare 4, potentially your whole directory tree can go down and nobody in the company can do anything," said Chris Thomas, manager of technology services at Bramley, Ltd., a real estate management and development firm, plus a NetWare 4 user, in Toronto. "This is a much larger beast [than NetWare 3]; you've got a much higher level of exposure.

"NetWare is mission-critical for us — our whole business runs on NetWare, but Novell doesn't have mission-critical support," Thomas added. "What they're planning sounds like a good idea." ◘

Comments?
See "Contacts" box on page 2.

HP takes a stab at the high-end routing market

BY SKIP MACASKILL

Palo Alto, Calif.

Hewlett-Packard Co. this week will roll out its first high-end router as well as the industry's first 100VG-AnyLAN products, which include a multiport hub and two adapter cards for 100M bit/sec Ethernet nets.

The new five-slot, chassis-based AdvanceStack Router 650 marks HP's expansion beyond the low-end internetworking market and into the market for corporate backbone routers.

The system will be positioned directly against the Cisco Systems, Inc. 7010, Wellfleet Communications, Inc. Backbone Link Node-2 and 3Com Corp. Netbuilder II routers.

"The 650 serves notice that HP is ready to come upstairs to play with the big boys," said Tam Dell'oro, senior industry analyst for Dataquest, Inc., a consultancy in San Jose, Calif. "Since the product will debut at a very aggressive price point and is based on good technology, HP will take a pretty good shot at competing in what is unfamiliar territory to it."

Depending on configuration, the 650 will be priced at least one-third lower than competing routers (see graphic).

One slot in the 650 is reserved for a central processing module based on an Intel Corp. i960 Reduced Instruction Set Computing chip. The remaining four slots will support local- and wide-area network interface cards also outfitted with i960 microprocessors.

The 650 will support a distributed routing architecture, meaning that each card will handle route processing for traffic local to that card. The interface cards will only pass packets to the central processor for traffic going between

See **HP**, *page 80*

Taking on the big boys

	HP's AdvanceStack Router 650	3Com's NetBuilder II	Cisco's 7010	Wellfleet's Backbone Link Node-2
LAN ports	16	16	18	16 Ethernet or 8 token rings
WAN ports	16	24	24	16
Redundant power supply	Optional	Optional	No	Optional
Hot swappability	Yes	Yes	Yes	Yes
Compression	Yes	Yes	Header only	Yes
Flash EPROM	Yes	Optional	Yes	Yes
Warranty	3 years	1 year	90 days	90 days
Price (4-Ethernet/ 4-WAN port)	$16,485	$18,500	$32,400	$30,000

EPROM = Erasable programmable read-only memory

Intel to peddle low-cost LAN access via ISDN

BY DAVID ROHDE

New York

Intel Corp. last week dove into the remote LAN access market with some eye-popping prices for products supporting Integrated Services Digital Network interfaces.

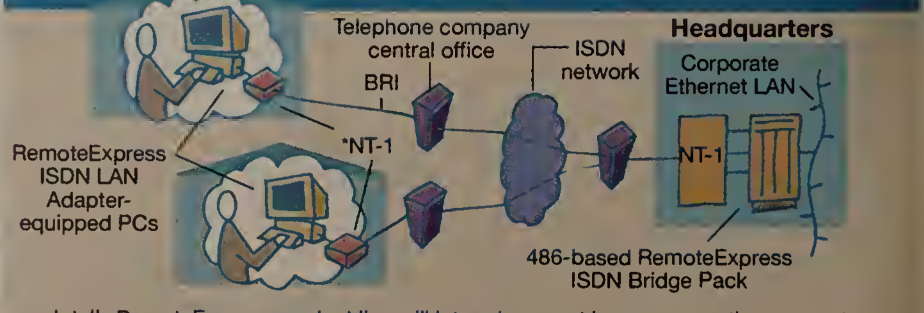
Intel said it will suggest a price of $499 or less for the RemoteExpress ISDN LAN Adapter, a board-level ISDN terminal adapter for personal computers at the home or branch locations. The product will be sold through four regional Bell holding companies and Intel Corp. value-added resellers.

To complete the ISDN connection at the corporate local-area net, Intel will offer the RemoteExpress Bridge Pack. It combines Intel's existing EtherExpress LAN adapter and the new ISDN LAN Adapter with software that turns virtually any 486-level PC into a LAN bridge.

Dynamic bandwidth allocation allows the network to assign either one or both of the two 64K bit/sec B channels on each Basic Rate Interface (BRI) to an

See **Intel**, *page 10*

At home on the LAN


Telephone company central office
BRI
ISDN network
Headquarters
Corporate Ethernet LAN
RemoteExpress ISDN LAN Adapter-equipped PCs
*NT-1
NT-1
486-based RemoteExpress ISDN Bridge Pack

Intel's RemoteExpress product line will let end users at home access the corporate network over ISDN links as if they were in the office. Each Bridge Pack can support as many as six simultaneous users with a maximum of three BRI links.

*Combination power supply and two-wire-to-four-wire converter

GRAPHIC BY SUSAN J. CHAMPENY

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Circle Reader Service #12

NET MANAGEMENT

New Spectrum release offers distributed mgmt. functionality

BY SKIP MacASKILL

Durham, N.H.

Cabletron Systems, Inc. this week will roll out a new version of its Spectrum net management platform that provides distributed net management functionality in client/server architectures.

By allowing users to build common management databases that are distributed throughout the enterprise via Cabletron's modeling technology, Spectrum will help reduce the traffic overhead associated with centralized net management and allow for local troubleshooting where appropriate.

Cabletron this summer will deliver Version 3.0 of Spectrum, which will feature this distributed functionality as well as a suite of other new enhancements.

"A distributed management scheme provides scalability benefits in allowing the manager to break up large, complex environments into smaller pieces that are easier to handle and track," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

"If Spectrum is as distributed as Cabletron claims, it gives them an edge over OpenView, which probably won't offer distributed features until 1995," he added.

NetLabs, Inc. is the only platform vendor that is currently shipping a distributed product. SunConnect will incorporate NetLabs' distribution technology into its SunNet Manager platform, but that integration will not happen until the first quarter of 1995.

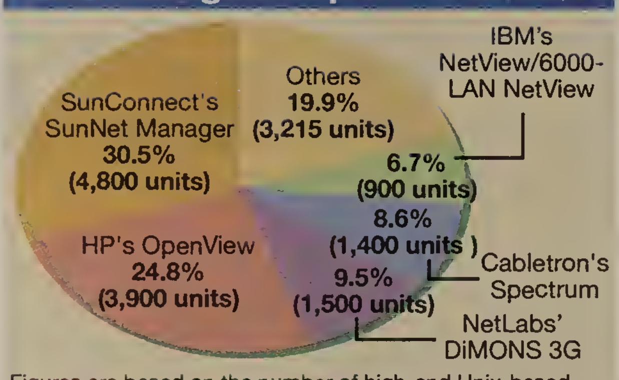
SPECTROSERVERS

Distribution in Spectrum 3.0 is accomplished through Unix workstations, dubbed SpectroServers, that are configured as network management databases. The SpectroServer is given control of a server domain, which is user-defined and based on the geographic distribution of the enterprise net.

These SpectroServers collect configuration data from the devices located in its domain and use Spectrum's inductive modeling technology to create a working model of every component in the net.

The SpectroServers will poll the devices in their domain and monitor alarm thresholds, eliminating the need for a centralized management console to poll every device in the network, which reduces the amount of net management traffic flowing across the network.

1993 management platform leaders



Figures are based on the number of high-end Unix-based platforms shipped last year. Worldwide shipments of these systems increased 33.6% in 1993, with 15,715 units shipped.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

SpectroServers can be managed from any location in the network by any workstation configured as a SpectroGraph console, which acts like a client to the SpectroServer. If one SpectroServer fails, another one can assume its management duties, offering users a level of management fault tolerance.

"Before Spectrum 3.0, I had to poll multiple devices and network systems, but now I only have to access one SpectroServer to get all the information I need," said 3.0 beta user Michael Smith, telecommunications manager for Credit Suisse USA in New York. "Distributing management in that way ends up being a big time saver, which in turn, reduces my WAN costs since I'm spending less time polling devices across my WAN links."

Cabletron will also include a Spectrum Data Gateway feature in 3.0 that allows Spectrum to act as a enterprise manager of managers, compiling alarms and events from other platforms such as Hewlett-Packard Co. OpenView and SunNet Manager as well as synchronizing their databases.

OTHER ENHANCEMENTS

Other Spectrum enhancements will include a Configuration Manager capability that lets users change and monitor the configuration of Simple Network Management Protocol-based devices from any vendor; an Online Backup feature that allows SpectroServer backups to be done in the background without shutting down the server; and Adaptive Modeling, which allows Spectrum to build network models for any new device on the network that supports SNMP.

Cabletron will also enhance Spectrum's graphical user interface (GUI) by integrating more tools and utilities, which makes it easier to edit network views, zoom in and out as needed and generate six different report types.

"By integrating more tools into the GUI, such as autoplacement of devices, control panel functions and [media access control] address locators, Spectrum 3.0 gives me more flexibility in viewing my network and keeping it up-to-date," Smith said. "I now have a net management system that can keep up with changes in my physical network."

Spectrum 3.0 will be available in June.
©Cabletron: (603) 332-9400.

CyberSpeak: *Voices from the reader network*

The federal government is making more noise about going after Microsoft for alleged anticompetitive behavior. Do you think Microsoft abuses its market power?

"Microsoft's biggest strength is taking mediocre products and marketing the hell out of them, stomping on anyone that gets in its way. Smaller companies would get sued, regulated, cited or all of the above for such tactics. Because of Microsoft's ability to characterize itself to judges and legislators as 'the software company that is the driving force behind the information revolution,' Microsoft has been successful at avoiding punitive judgments and antitrust legislation."
Bill Davies, network manager, Central California Appellate Program, Sacramento, Calif.

"Most of the noise I've heard against Microsoft has been from companies having trouble keeping up with its level of competency. Bill Gates' company keeps pushing for new software technology ahead of these others. If not for Bill Gates' company, we'd still be stuck using dumb terminals connected to IBM mainframes."
Robert Huxley, a materials systems specialist, New England Business Service, Inc., Groton, Mass.

"No, I don't see that. In the applications software area, the competition is giving Microsoft a run for its money. Lotus Suite is selling fairly well, and Novell is trying to put together a suite to compete in the same arena.

In the operating system environment, Microsoft was heading toward monopoly status over the last couple of years, but there is competition out there, and it is holding Microsoft somewhat at bay. Microsoft is getting some Unix competition, and IBM is getting some good press on OS/2."
Victor Mutnick, corporate vice president, New York Life Insurance, Inc., New York

"I don't think they abuse their power, I just think they work harder than anybody else. They do their best to make sure their products are really good, and a lot of the other guys are just jealous of the operation they've got and they want someone other than themselves to fix it. They look toward the government for it."
Anders Snorteland, MIS director, Random Access, Inc., Denver

NextWeek CyberSpeak Out!

Do you think Judge Harold Greene has too much control over the communications industry?

Responses due by 8 p.m. Thursday, April 21. T-shirts for those whose responses are printed.

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AT&T proposes to open Illinois local market

BY JOANIE WEXLER

New York

A proposal filed last week by AT&T to test just how well an open local telecommunications market would actually work could pave the way for increased switched-service choices and lower costs.

Then again, it could stall the entrance of new service providers — such as the regional Bell holding companies — into the long-distance arena, impeding competition there.

AT&T filed a proposal with the Illinois Commerce Commission (ICC) for a statewide trial that would take place under conditions deemed by AT&T to constitute a level playing field for local competition. The idea is to invite multiple players into Illinois' market to test whether a local exchange free market is technically plausible and financially practical, AT&T said.

The conditions for competition set forth by AT&T include full Bell net interconnectivity for rivals at consistent, cost-based prices. They also call for telephone number portability and a consistent dialing plan among carriers. These conditions do not exist today.

"If you're not able to get a local number, you're not going to be much of a competitor," pointed out Brian Moir, counsel to the International Communications Association user group and a partner with law firm Moir & Hardman in Washington, D.C. He said the AT&T filing was "obviously triggered by the fact that there is a lack of real local competition today" in the largest segment of local business: switched services.

Like Illinois Bell, participants in AT&T's proposed trial would probably have to abide by ICC conditions for consistent quality of service across major serving areas and subsidized rural areas, and for special services to the aged and poor.

The AT&T proposal builds on the Customers First plan filed by Ameritech with the Federal Communications Commission in February. Under that plan, Ameritech proposed opening up its local switched network under its own, narrower set of competitive terms in return for the right to offer long-distance services.

While the Ameritech proposal makes strides in letting in local competitors, its caveat for obtaining long-distance rights may not create ideal conditions for true competition, AT&T contended.

A spokesman for competitive access provider MFS Communications Company, Inc. agreed, though he said, "We're in favor of any plan that furthers the competitive situation," including Ameritech's.

Most local telephone business lies in switched services, though nearly all alternatives to Bell service today — such as most from MFS — address interstate or special access, as mandated by the FCC last year.

Whether the AT&T test will happen is contingent on ICC approval, which could come in days, months or not at all. If approved, it could put Ameritech's pledge to local competition to the test by speeding the entry of new rivals into that region without Ameritech getting the long-distance go-ahead.

Ameritech, in fact, asserted that the AT&T proposal is more a tactic to delay others' entry into the long-distance arena than to further local competition.

AT&T said its filing in no way reflects a desire to reenter the local exchange market, but rather is a move to spur lower local access charges both for itself and its customers.

CORRECTION

An incorrect phone number for Worldtalk Corp. was printed in a story that ran on page 33 of the April 11 issue. The correct number is (408) 399-4000.

"I want to see that hunky Robert Mitchum in 'Pancho Villa Lives.'"

"Without leaving my couch."

Digital expands its client/server portfolio

Unleashes Alpha-based server, DCE for Windows NT.

BY JIM DUFFY

Maynard, Mass.

Digital Equipment Corp. last week fortified its client/server stockade with several new and enhanced products designed to leverage the company's Alpha technology in enterprisewide distributed computing.

Digital's product blitz included a new multiprocessor server that supports as many as four Alpha CPUs, Distributed Computing Environment (DCE) software for Windows NT, X.500 directory services for workgroup environments, and extensions to its Pathworks LAN operating system and IBM connectivity software.

Chief among the products rolled out is the Digital 2100 Model A500MP departmental server, which had been code-named Sable (*NW*, April 5, 1993, page 1). The 2100 supports a maximum of four 190-MHz Alpha microprocessors, 2G bytes of memory and up to 170G bytes of disk storage.

The server sports two bus architectures, the Peripheral Component Interconnect (PCI) design and the Extended Industry Standard Architecture (EISA). The PCI bus runs at 132M byte/sec and supports three expansion slots. The EISA bus runs at 33M byte/sec and has eight expansion slots.

How Digital's new server stacks up

Server	Number of processors	Maximum memory (bytes)	Disk (bytes)		I/O bandwidth (bit/sec)	Entry price
			Maximum internal	Total		
Digital 2100 Model A500MP	1-4	2G	32G	200G+	132M	$26,900
HP 9000 H60	1	768M	10G	300G	32M	$76,000
Sun SPARCserver 1000 2 CPU	1-8	2G	8.4G	100G	32M	$46,700
IBM RS/6000 58H	1	2G	12G	460G	80M	$66,400
Compaq Proliant 4000	1-4	512M	14G	140G	32M	$17,500

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: DIGITAL, MAYNARD, MASS.

Digital is pitting the 2100 against competitive offerings from IBM, Sun Microsystems, Inc., Hewlett-Packard Co. and Compaq Computer Corp. (see graphic).

Users look forward to kicking the 2100's tires. "I'm pretty excited about it; I want to see what it can do," said Bill Mitchell, computer operations supervisor for the city of Chandler, Ariz. "I think the price is pretty good. I want to see what symmetrical multiprocessing will do for a nonengineering environment."

The server supports the OpenVMS, DEC OSF/1 and Windows NT Advanced Server operating systems. Prices start at $18,900, with availability this month.

NT GETS DCE

DCE software for Windows NT, which was expected (*NW*, May 17, 1993, page 9), will allow users to develop distributed, client/server applications that run on Windows NT workstations and servers, including Digital's new 2100. These applications will interoperate with other DCE applications, no matter what platform they run on, Digital said.

DCE Version 1.0 for Windows NT consists of two components: the Digital DCE Runtime Services and the Digital DCE Applications Developer's Kit. The run-time works on client workstations and supports the full suite of DCE services, including remote procedure calls (RPC), timing, security, threads and cell directories. The tool kit allows developers to write DCE-compliant Windows NT applications that call on multivendor DCE servers for task execution.

DCE Runtime Services 1.0 for Windows NT costs $95, while the tool kit for this release is priced at $295. Both products will be available in June.

Digital's new directory services for workgroups, software called InfoBroker, provides a method for users to access the names and locations of databases and applications. Support for the X.500 directory standard means InfoBroker users can connect to other directory services that also support X.500, thereby extending their resource location capabilities.

It includes two software components that run on OSF/1 servers and Windows clients, respectively. InfoBroker Server Version 1.0 stores information about users and resources. It can serve as either a local workgroup directory in a local-area network environment or as a gateway to a global X.500 directory service.

InfoBroker Client Version 1.0 is a Windows application that allows users to access, browse and search for information in the InfoBroker Server or the X.500 global directory to which the server is attached.

Both support Transmission Control Protocol/Internet Protocol and DECnet protocols and are available now. The server components cost less than $1,000, while the client piece costs less than $40.

For users of Pathworks LANs, Digital added a developers' tool kit that lets users and developers write distributed applications based on a variety of middleware products, including: DCE, InfoBroker, and Digital's ObjectBroker object request broker (ORB) and DECmessageQ queued messaging software.

With this tool kit, users and developers can write distributed Pathworks applications that exchange messages and invoke routines using the three most popular technologies for such tasks: RPCs, ORBs and queued messaging.

The tool kit supports the OpenVMS, Windows, Windows NT and OSF/1 operating systems. The kit will be available in June and costs from $495 to $2,995.

Lastly, Digital unwrapped IBM Systems Network Architecture connectivity software, DEC SNA 3270 Application Services, that lets users write OpenVMS and OSF/1 applications supporting 3270 data streams. This allows users on Digital systems attached to SNA nets via a gateway to share data with IBM systems. DEC SNA Application Services 1.1 is available now for $4,032.

©Digital: (800) 344-4825.

Intel

Continued from page 6

individual user.

The Bridge Packs, supporting as many as three BRIs apiece or a maximum of six simultaneous users, carry a suggested price of $2,199.

Some carriers will be offering even juicier deals on the products for users that order new ISDN lines.

Pacific Bell will offer the RemoteExpress ISDN LAN Adapter for $199 apiece, while BellSouth Corp. will offer the product – plus the NT-1 device required to connect standard two-wire lines to the four wires ISDN requires – for $399.

The cost of other companies' ISDN terminal adapters – ranging up to $900 – have sometimes scotched work-at-home remote LAN access programs (*NW*, April 4, page 1).

"The pricing made me whistle," said Richard Doherty, director of The Envisioneering Group, a market research and product testing firm in Seaford, N.Y. "We have an understanding that it's a different arrangement with each carrier."

John Gallagher, a systems analyst for the Harford County Public Schools in Maryland, last month installed RemoteExpress Bridge Packs at the school district's headquarters, a high school and a middle school.

Each of these facilities' networks are now bridged segments on the district's VINES LAN, and PCs at seven other middle and high schools dial in to the LAN using ISDN BRIs.

"That way, we can avoid putting servers in as many locations as we can," Gallagher said.

In a demonstration here last week, Intel showed off the performance of RemoteExpress product line. Using ISDN lines to dial in to an Intel corporate LAN in Hillsboro, Ore., remote users in New York were able to obtain virtually identical response times to those users at the corporate LAN.

But Intel still faces the problem of spotty ISDN availability from the telephone companies.

To goose the ISDN market, Intel established an ISDN Connectivity Information Center, accessible by voice line or bulletin board service, that purportedly maintains a database of all telephone exchanges where ISDN is available.

"It's going to be a real buyer's market [for ISDN adapters] this spring and summer," Doherty said. "But it all comes down to, 'Can I get ISDN?' As one of the 11 million people in the shadow of the Empire State Building who still can't get ISDN, I have to say it's still a good question."

©Intel: (800) 538-3373.

HP, Oracle unite on three separate fronts

BY JIM DUFFY

Redwood Shores, Calif.

Hewlett-Packard Co. and Oracle Corp. last week said they will integrate the Oracle7 database with HP's OpenView systems and network management platform, and port an Oracle tool to OpenView that will help users manage databases distributed across an enterprise.

Support for Oracle7 will allow users to deploy one of the most widely used databases to store information about the devices and other objects managed by OpenView. Currently, OpenView supports an Ingres database.

It also signals OpenView's evolution into a database-independent net management system. Within the next year, HP plans to support Sybase, Inc. and Informix Software, Inc. databases, as well, said Gordon MacKinney, HP OpenView program manager.

Support for multiple databases and management of distributed databases are hot areas for management platform vendors these days. IBM, for example, soon plans to beta-test a new release of its NetView/6000 system that supports the four leading databases (*NW*, April 11, page 8).

Also, IBM recently announced a relationship with LEGENT Corp. to develop NetView/6000 agent software for databases (*NW*, March 7, page 1).

OpenView users will also be able to manage Oracle databases by running Oracle's Server Manager graphical database administration tool.

Server Manager is said to support the new Simple Network Management Protocol Management Information Base (MIB) for databases, which allows SNMP platforms such as OpenView to issue GET, SET and TRAP commands for polling, setting thresholds and capturing event data on distributed databases. In other words, databases can be managed like an SNMP device.

But the SNMP MIB for databases is still being defined and refined by the Internet Engineering Task Force, which leads some users to believe that Oracle's MIB is proprietary.

Support for multiple databases and management of distributed databases are hot areas for management platform vendors these days.

"Since that's still a working [document], how has Oracle implemented it?" asked Frank Belland, senior communications consultant at Martin Marietta Corp. in Orlando, Fla. "It sounds like it might be proprietary because there is no agreement among the database vendors at this point."

Oracle could not be reached for comment by press time.

Support for Server Manager adds to OpenView's database management tool portfolio. The platform also supports applications from BMC Software, Inc. and Compuware Corp. for management of multivendor databases, including Oracle systems.

In conjunction with the joint product announcements, Oracle said it will use OpenView to manage more than 5,000 SNMP nodes in 30 countries. The company will also use HP's OpenView Node Manager for NetWare application to manage some 300 Novell, Inc. NetWare servers distributed throughout its network.

Oracle7 and Server Manager will be available on OpenView by the end of the year, MacKinney said.

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Banyan attempts to calm VINES pricing waters

Rolls back deadline for controversial price hike.

BY CHRISTINE BURNS

Atlanta

Banyan Systems, Inc. officials last week tried to calm fears about a new pricing model for VINES, and even made some moves to ease the logistical and financial burden of the change. But they were not backing down from the plan.

Users have been up in arms about Banyan's abrupt decision to slap a limit on the number of end users that can be supported by a VINES server (*NW*, Feb. 28, page 1). Users with previously unlimited VINES licenses are upset about the potential cost increase — which could be as high as 50% for some customers — and the short notice they were given to make the change throughout their enterprise nets.

In response, Banyan has rolled back the deadline for implementing the change from April 1 to Sept. 1. By then, customers have to be clear about how many users their VINES servers are supporting. The firm also promised at the Association of Banyan Users International (ABUI) conference here to provide an auditing tool by the end of this quarter that will help customers do that and determine how many licenses they need to buy. Banyan is also offering several transition alternatives to help users ease into the new pricing structure. The company said existing servers can be moved to the new pricing structure when customers renew service contracts or when they upgrade to a new version of VINES.

All new VINES servers will be sold under the user-based pricing structure, effective immediately.

After the Sept. 1 deadline, the company will implement some type of metering program to monitor software licenses throughout its installed base.

Users still aren't crazy about the pricing change, but they welcomed Banyan's efforts.

"Early on, Banyan didn't articulate its reasoning for the change very well," said current ABUI President Ted Kull. "While we can't tell them how to run their business, we can tell them the problems we have with how they run their business. These changes show they are listening to us."

But some customers are looking for more.

Neil Becker, senior systems analyst in control of a 700-user VINES network for the Michigan Department of State in Ann Arbor, said Banyan should give all current users a 250-user license for each unlimited license they have now. New pricing should only apply to new servers purchased, Becker added.

"The smaller guys who only have five or 10 users on a server won't have any trouble making the switch. But we are going to have invest a lot of time rearranging users in order to get the right user counts on all of our servers," Becker said.

"I've completely lost the flexibility I used to have under the old pricing scheme," said one user who runs a 500-seat network in Toronto. "Now when I get up to 102 users on a server that's only licensed for 100, I've got to run out and buy another license."

According to Pam Campagna, VINES product-line manager for Banyan, the new pricing is in line with industry trends and is an interim step toward enterprisewide per-seat pricing.

One administrator who runs a 1,000-user VINES network with 21 servers in Greenwich, Conn., said he understands the reasoning behind the switch, but added that counting users and dividing up servers is going to be a hassle. "VINES is not a simple [network operating system] like NetWare, and calculating user counts is going to be a big pain," he said.

But most users said the pricing change probably will not force them to switch to another NOS.

"Banyan's got us right where they need us," said Michael Ullman, a planner with Rockwell International Corp. in Seal Beach, Calif. "It's probably going to cost us more to pay user-based prices, but it's not going to cost us as much as if we went with another operating system. So we'll learn to live with it."

©Banyan: (508) 989-1000.

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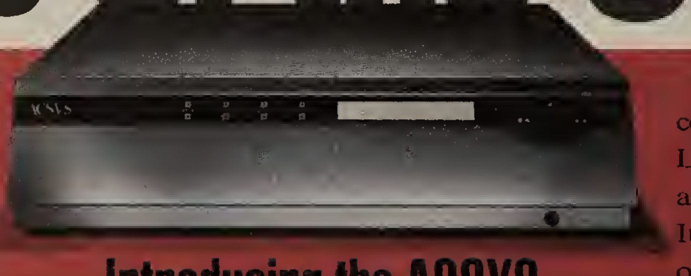
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National

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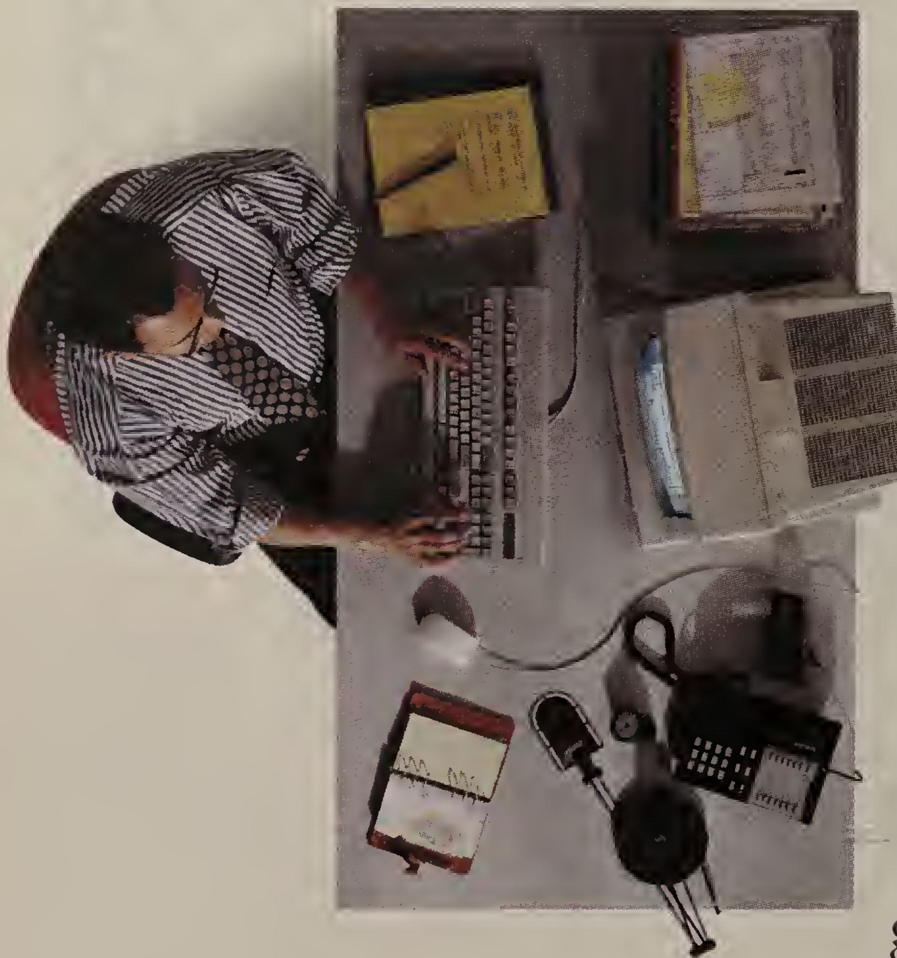
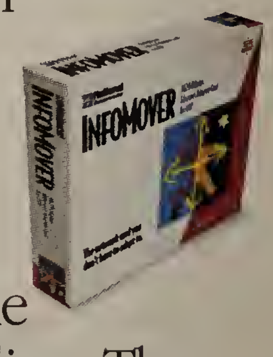
In fact, there's a very good chance that, if you work in a network of PCs, you've worked with us before. Because 2 out of every 3 Ethernet cards installed in desktop PCs today use chips designed by National. You see, we sell our fast, reliable Ethernet chips to other companies who, in turn, design them into the boards they sell.





Recently, however, we've decided the time is right to put our reputation on the line—the National InfoMover™ product line. The ideal family of network products designed to make it easier for people to work together.

For typical desktop PC environments, there's our easy-to-install NE2000plus Ethernet cards that make it easier for a large group of people to work together better—and faster. Of course, for PC workstations and file servers, you can use our high-performance FDDI cards.

NOVELL.
A better red than red.
For those of you who want the security of knowing that your network cards are "Red Box" compatible, rest assured that InfoMover cards are all that—and more.

Finally, for those who value mobility, there's our equally-easy-to-install InfoMover NE4100 PCMCIA Ethernet Adapter for notebook PCs with a Type II slot. Unlike PCMCIA cards available from some

For those in the office.

InfoMover.

The power is on.
The InfoMover NE4100 PCMCIA Ethernet Adapter supports card and socket services so it can be "hot-swapped," inserted into or removed from a notebook while it's on.

PC MAGAZINE EDITORS' CHOICE
December 21, 1993
NE4100 PCMCIA Ethernet Adapter Card

other premium suppliers, the NE4100 fully supports industry-standard card and socket services. In fact, with InfoMover software installed on your notebook, PCMCIA cards—such as our NE4100 card, as well as memory expansion cards and modems—can be "hot-swapped." This means PCMCIA cards can be inserted and removed without the notebook being turned off each time.

LIFETIME WARRANTY

Thanks for the support.
We offer 24-hour-a-day, 7-day-a-week, toll-free technical support. And InfoMover products come with a lifetime warranty.

Now before you ask, we want to assure you that all InfoMover products have been codeveloped with Novell to ensure that they'll seamlessly integrate with NetWare® environments. And, best of all, they're compatible with virtually all industry-standard hardware and software—and include support for Microsoft, IBM, and Banyan networks.

Give us a ring.
We've put together a short, informative videotape that outlines the advantages of the InfoMover product line. Just dial 800-227-1817, ext. 32. The call and the tape are free.

So if you'd like to know how the InfoMover product line can fit in with the way you work, give us a call today at 800-227-1817, ext. 32.

National, InfoMover, and you.
A connection well worth making.

National Semiconductor

And those on the go.

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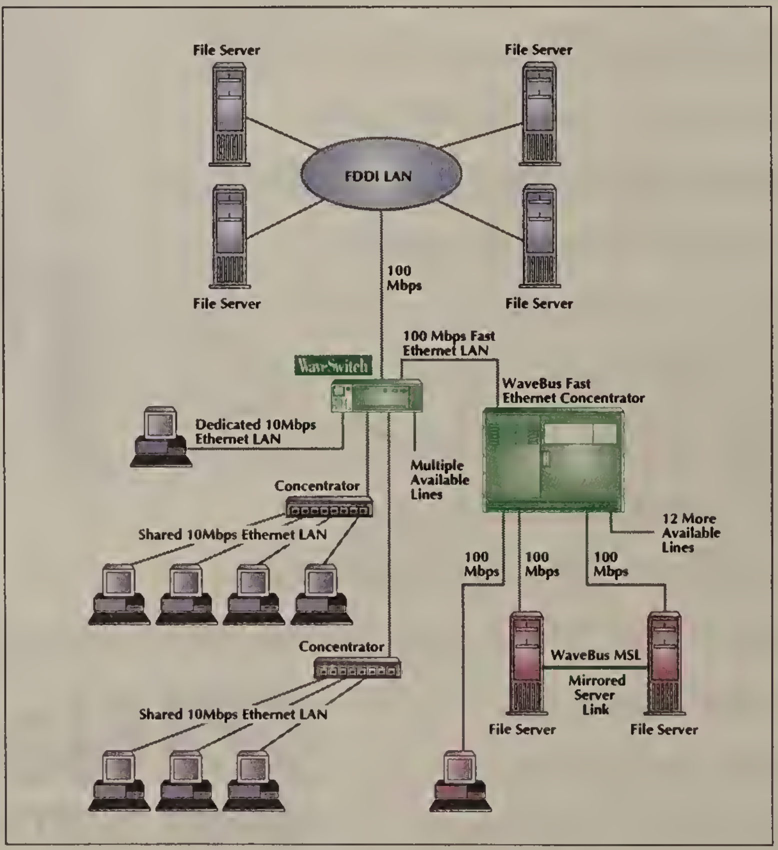
With Plaintree Systems your Ethernet users won't have to take a number.

In today's network environment, overcoming slow Ethernet service can often be a challenge. Especially if you'd like to preserve your current network investments. Fortunately, there's an easy, economical solution for maximizing Ethernet bandwidth and simplifying overall LAN management: WaveSwitch, from Plaintree Systems.

A new standard of switching performance.

WaveSwitch provides high-speed Ethernet switching with the operational simplicity of bridging. Thanks to our unique, ASIC-based fast bridging technology, WaveSwitch offers both greater internal switch throughput and full 802.1d compliance. So you can filter or redirect particular addresses, protect your LAN against bad frames and fragments and perform spanning tree procedures while directing network traffic for maximum efficiency. All without changing existing Ethernet adapters and wiring. There's no easier way to ensure all your users the bandwidth they require.



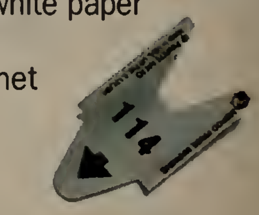
PLAINTREE OFFERS PROVEN, COST-EFFECTIVE SOLUTIONS FOR MAXIMIZING LAN RESOURCES AND SIMPLIFYING OVERALL LAN MANAGEMENT.

The right connections for superior service.

WaveSwitch also provides a variety of flexible 100 Mbps connections. We offer links to FDDI and WaveBus — our own fast Ethernet — and, when standard, ATM and fast Ethernet. For maximum flexibility, we provide these links through modular cards, not hard code. As a result, you'll always be free to change connections easily and inexpensively as high-speed LAN technologies, and your organization's needs, evolve.

Call for our white paper on Ethernet switching.

To learn more about enhancing Ethernet network performance, call us toll-free today at **800-370-2724**. We'll send you a copy of our new white paper entitled "Improving Ethernet LAN Performance with Ethernet Switching." There's no better way to begin building a network that will make all your users feel like they're number one.



PLAINTREE®
SYSTEMS

Circle Reader Service #8

ENTERPRISE INTERNETS

Data Network Architectures, Standards, Equipment and Management

REMOTE ACCESS

3Com offers new security level on AccessBuilder

BY SKIP MACASKILL

Santa Clara, Calif.

3Com Corp. last week announced a series of enhancements to its line of remote access servers that will ease the complexity of Internet Protocol address management and provide a new level of security.

The company's AccessBuilder family gives mobile users access to token-ring and Ethernet network resources in corporate data centers and remote branch offices via dial-up lines. Previously known as the CentrumRemote 3000 line, the products were acquired when 3Com bought Centrum Communications, Inc. in February.

3Com has added a capability whereby AccessBuilder automatically assigns an IP address to a device after it gains access to the network. AccessBuilder maintains a limited number of IP addresses in a pool. After a user terminates a connection, the address they were using is returned to that pool.

To ensure security, 3Com has added support for features provided by The Open Software Foundation, Inc.'s Distributed Computing Environment (DCE).

The DCE facilities allow net administrators to centrally manage security via a local-area network-attached security server. A security software agent running on AccessBuilder acts as an authentication conduit between that device and the security server so users requesting access to the LAN can be authenticated by the server.

"3Com's AccessBuilder has the highest multiple user throughput of any remote access product we've tested."

-Brian McGiffert
LANQuest Labs

3Com also rolled out new features on the client side, including Dial Scripting and Chaining.

Dial Scripting allows the mobile user to support third-party front-end security devices, as well as store scripts for frequently dialed telephone numbers.

Chaining lets users preconfigure their working environment before dialing in to the corporate LAN.

"Chaining is helpful in our Microsoft LAN Manager environment," said Paul Kreider, technical research engineer at Hewlett-Packard Co. in Atlanta, a user of the product. "After you run dialer in Windows, Chaining will put you into a utility that allows you to preload your net logons to servers and the printer connections you need. It will also keep track of the resources you access and how long the dial-up sessions lasted, which is good for network accounting purposes."

Pricing for the four-, eight- and 16-port Ethernet versions of AccessBuilder begins at $3,495, $4,495 and $6,295, respectively. Prices for similar configurations for the token-ring model are $4,495, $5,495 and $7,295, respectively. All models are available now.

©3Com: (408) 764-5000.

Tivoli unveils larger scale systems mgmt. platform

TME 2.0 integrates net, systems, database mgmt.

BY JIM DUFFY

Austin, Texas

Tivoli Systems, Inc. last week rolled out a new version of its systems management platform that includes support for a greater number of devices and network resources.

The Tivoli Management Environment (TME) is an object-based framework and suite of applications for managing Unix systems dispersed throughout an enterprise network. TME Version 2.0 now allows users to integrate network and database management, along with systems management, and expands platform support to Windows NT clients and servers, as well as DOS and Windows clients.

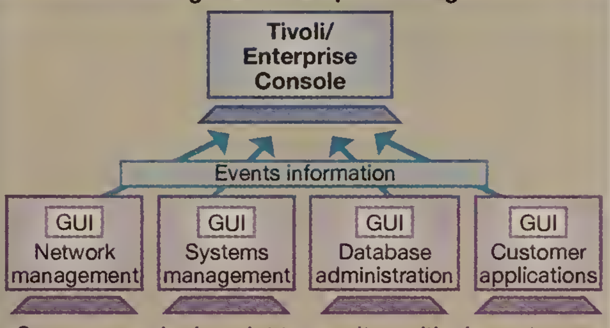
TME 2.0 also features scalability enhancements. Systems managers can now govern hundreds of servers and tens of thousands of client workstations from a single console, the company said. Currently, a single Tivoli console supports about 200 clients, according to users.

And TME 2.0 is the first iteration of the Tivoli management system to support the Object Management Group's Common Object Request Broker Architecture (CORBA). CORBA is a standard implementation of an object request broker, software that locates objects relevant to the function of a management application.

The new platform is intended to address problems inherent in large-scale systems management, such as inconsistent administration and a larger number of faults and failures, said John Hime, vice president of marketing for Tivoli.

Tivoli goes after the enterprise

Integrated event processing



- Serves as a single point to monitor critical events.
- Provides consistent display of events from diverse sources.
- Includes rules-based filtering and correlation.
- Offers automated operation and a help desk interface.

GUI = Graphical user interface

GRAPHIC BY TERRI MITCHELL

"It's designed to consistently set up user profiles and eliminate confusion and fault probability," he said.

For integrated management of systems, nets and databases, Tivoli rolled out a new application called Tivoli/Enterprise Console. The console correlates, displays and responds to events by invoking an automated routine or alerting an operator, Tivoli said.

Enterprise Console works with Tivoli/Sentry, the company's intelligent agent software that collects events from managed systems and forwards them to management stations. Enterprise Console also works with "event adapters," software that users develop using a Tivoli tool kit that allows third party products and custom applications to forward event information to the console.

The Enterprise Console can provide integrated management of systems, networks and databases through Sentry and the event adapters. Sentry generates events for managed systems, and the event adapters can be added to management applications resident on consoles for handling networks and databases, such as Hewlett-Packard Co.'s OpenView, IBM's NetView/6000 or SunConnect's SunNet Manager.

CORRELATING INFORMATION

Once event information is received by the Enterprise Console, it is correlated according to rules established by the systems manager. Rules may include automatic invocation of a script file that would launch an application in response to a particular event.

The correlated information is then delivered to the appropriate administrator, whether the person is a network, systems or database manager.

Coinciding with its ability to manage a greater number of devices, TME 2.0 fea-

See Tivoli, *page 20*

BRIEFS

Frontier Software Development, Inc. last week brought out new software for its **Netscout** local network probes that combines remote traffic monitoring with Simple Network Management Protocol polling.

Frontier's Resource Manager software allows Netscout segment monitors to poll SNMP-managed devices locally, rather than having a central SNMP console perform remote polling over wide-area network links. Combined with Netscout's Remote Monitoring (RMON) Management Information Base (MIB) support, Resource Manager can provide network managers with tabular or graphical statistics on RMON-based LAN traffic and status information on SNMP-based devices at a Netscout Manager console.

With Resource Manager, Netscout probes can now perform SNMP functions such as ping sweeps to determine if a node is active or inactive, GET commands to poll device MIBs and threshold setting for alarm triggering. They can also execute remedial commands issued from a Netscout Manager console.

Resource Manager is priced at $695 per probe. It will ship in May.

Frontier: (508) 851-5700.

For a limited time, users can receive a 47% discount on **IBM 3174 controllers** equipped with Token-Ring or Ethernet adapters and a 15% discount on the **IBM 3172** local net interconnect controller.

Orders must be placed before July 29, and installation must occur before Aug. 26. Orders must be placed through IBM Direct at (800) 426-2255.

BlueLine Software, Inc. last week unveiled a graphical user interface for its network backup applications and announced an agreement with **Secure Computing Corp.**, a maker of computer security software.

BlueLine's HyperTape SCO Control Node Version 1.5 backup system now supports an Open Software Foundation, Inc. Motif graphical user interface on a personal computer. Users can now use point and click commands to execute HyperTape.

Previously, this application ran on a Digital Equipment Corp. MicroVAX platform with a command line interface.

HyperTape SCO Control Node 1.5 is available now. Pricing starts at $30,000.

Under the agreement with Secure, BlueLine will port the company's LockOut security software to the IBM MVS operating system. BlueLine will also sell the new version of LockOut.

The MVS version of LockOut will be available in the third quarter. Pricing has not been determined yet.

BlueLine: (800) 826-0313.

The Complete PC has upped the ante in the 28.8K bit/sec modem war with two models priced at less than $300.

The company's **TurboModem V.Fast line** includes internal and external devices. The internal modem is priced at $229, while the external model costs $279. Both will be available this week.

Previously, the lowest priced 28.8K bit/sec modems on the market, both priced at $299, were a portable device from Microcom, Inc. and an external modem from Zoom Telephonics, Inc.

The Complete PC: (407) 997-9683.

BitRUNR™ broadens the landscape for dial-up enterprise networks.

Now you can extend the power of your enterprise system to all your remote users. With BitRUNR, your mobile users, telecommuters and branch office workers will enjoy easy, seamless access to the corporate network.

As the first high-performance, multiprotocol, dial-up brouter (bridge/router), BitRUNR provides remote users on all platforms unparalleled interoperability with all major protocols, including IPX, TCP/IP, AppleTalk, Windows NT, XNS, DECnet and others. From desktop, laptop or cellular environments, those users can be part of the network, using either ordinary or cellular modems as the situation requires.

BitRUNR minimizes line charges with on-demand dial-up bridging and routing. It optimizes performance in LAN-to-LAN connections with inverse multiplexing and can be configured for leased-line backup.

BitRUNR is part of a total Motorola UDS solution that ranges from laptop, to LAN, to digital. For details, call your distributor or contact us, today! 800/451-2369.
5000 Bradford Drive, Huntsville, AL 35805-1993.

MOTOROLA
UDS

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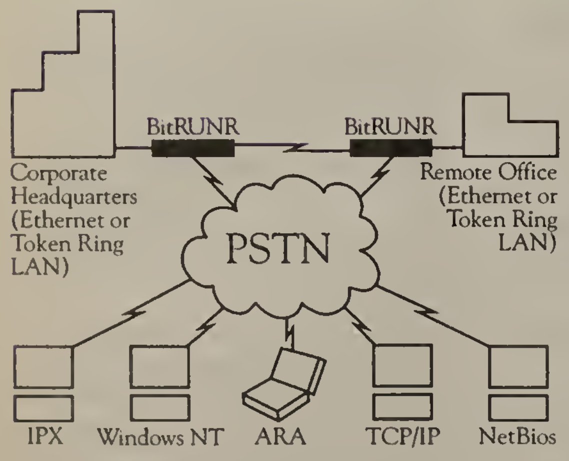
BitRUNR
BitRUNR
Corporate Headquarters (Ethernet or Token Ring LAN)
Remote Office (Ethernet or Token Ring LAN)
PSTN
IPX
Windows NT
ARA
TCP/IP
NetBios

Remote users:
Multiple platforms, multiple protocols.

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❮ Please attach your business card here

Name

Title

Company Name

Company Address

City/State/Zip

Signature Date

Business Phone Fax

1 Industry: (check one only)

01. ☐ Manufacturers (other)
02 ☐ Finance/Banking
03 ☐ Insurance/Real Estate/Legal
04 ☐ Healthcare Services
05 ☐ Hospitality
06. ☐ Retail/Wholesale Trade/Business Services
07. ☐ Transportation
08. ☐ Utilities
09 ☐ Education
10. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
11. ☐ Government (Federal/State/Local)
12. ☐ Military
13 ☐ Aerospace
14 ☐ Consultants (Independent)
15 ☐ Carriers/Interconnects
16. ☐ Manufacturers (Computer/Communications)
17. ☐ VAR/VAD/VAN/Systems Houses/ Software Houses
18 ☐ Distributors,Communications/Computers
19 ☐ Other__________

2 What is your Job Function? (check one only)

NETWORK IS Management:

1. ☐ Networking Management
2. ☐ LAN Management
3 ☐ Datacom/Telecom Management
4 ☐ IS,IT,MIS,Systems Management
5 ☐ Engineering Management

CORPORATE MANAGEMENT:

6. ☐ Corporate Management (CIO,CEO,PRES,VP, DIR,MGR,Financial Management)
7. ☐ Consultant (Independent)
8 ☐ Other__________

3 What is the total number of sites for which you have purchase Influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4 ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement In purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)

1 ☐ Corporatewide
2 ☐ Multienterprise
3 ☐ Departmental
4 ☐ None

B. INVOLVEMENT (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services.

A B LOCAL AREA NETWORKS

☐ 01 ☐ Local Area Networks
☐ 02. ☐ LAN Operating Systems Software
☐ 03 ☐ LAN Services
☐ 04 ☐ LAN Storage Devices (optical,tape,disk,etc.)
☐ 05. ☐ LAN Backup systems (optical,tape,disk,etc.)
☐ 06. ☐ Network Test Equipment
☐ 07. ☐ Intelligent Hubs
☐ 08. ☐ Cables, Connectors, Baluns
☐ 09 ☐ UPS
☐ 10 ☐ Network Adapter boards
☐ 11 ☐ Peer-to-Peer LANs
☐ 12. ☐ Wireless Networks
☐ 13 ☐ SNMP Network Management
☐ 14 ☐ ATM (Asynchronous Transfer Mode)
☐ 15. ☐ Remote Access LANs

A B NETWORK SERVERS

☐ 16 ☐ LAN Servers
☐ 17. ☐ File Servers/Applications Servers
☐ 18 ☐ Print Servers
☐ 19 ☐ Communications Servers/Fax Servers
☐ 20 ☐ Data Base Servers (Oracle, Sybase, etc.)
☐ 21 ☐ Superservers
☐ 22 ☐ Terminal Servers
☐ 23. ☐ Remote Access Servers

Involved Plan to Purchase

A B INTERNETWORKING

☐ 24 ☐ Bridges
☐ 25. ☐ Routers
☐ 26. ☐ Gateways
☐ 27. ☐ Bridge/Routers
☐ 28. ☐ Intelligent Hubs
☐ 29. ☐ Communications Servers

A B COMPUTERS/PERIPHERALS

☐ 30. ☐ Micros/PCs
☐ 31. ☐ Minis
☐ 32. ☐ Mainframes
☐ 33. ☐ Pen-Based
☐ 34 ☐ Laptops
☐ 35. ☐ Workstations
☐ 36. ☐ Image Processing Workstations
☐ 37. ☐ Front-End Processors
☐ 38. ☐ Terminals
☐ 39. ☐ Printers
☐ 40. ☐ Cluster Controllers
☐ 41. ☐ Fax Machines
☐ 42. ☐ X-Terminals

A B SOFTWARE/APPLICATIONS

☐ 43. ☐ Network Management
☐ 44 ☐ Micro to Mainframe
☐ 45. ☐ Security
☐ 46. ☐ Communication/Terminal Emulation
☐ 47. ☐ Word Processing
☐ 48. ☐ Operating Systems
☐ 49 ☐ Business Applications (Finance/Mfg/HR/etc.)
☐ 50. ☐ Applications Development
☐ 51. ☐ Data Base Management
☐ 52. ☐ Spreadsheet
☐ 53. ☐ Groupware
☐ 54 ☐ EDI
☐ 55. ☐ E-Mail
☐ 56. ☐ Windows/Graphical User Interface
☐ 57. ☐ 4GL Development
☐ 58. ☐ Multimedia
☐ 59. ☐ Graphics
☐ 60. ☐ Remote Access

A B WIDE AREA NETWORKS

☐ 61. ☐ Modems (9.6K bps and over)
☐ 62. ☐ Modems (under 9.6K bps)
☐ 63. ☐ T-1
☐ 64. ☐ T-3
☐ 65. ☐ Fractional T-1
☐ 66. ☐ Data Switches
☐ 67. ☐ SMDS
☐ 68. ☐ ATM (Asynchronous Transfer Mode)
☐ 69. ☐ Matrix Switches
☐ 70. ☐ Packet Switches
☐ 71. ☐ Protocol Converters
☐ 72. ☐ Diagnostic/Test Equipment
☐ 73. ☐ DSU/CSU
☐ 74. ☐ Microwave
☐ 75. ☐ Fax Boards/Modems
☐ 76. ☐ VSAT
☐ 77. ☐ Fiber Optic
☐ 78. ☐ Satellite
☐ 79. ☐ ISDN
☐ 80. ☐ PBXs (over 1000 lines)
☐ 81. ☐ PBXs (under 1000 lines)
☐ 82. ☐ Automatic Call Distributors
☐ 83. ☐ Voice Messaging Systems
☐ 84. ☐ Videoconferencing/Teleconferencing Systems
☐ 85. ☐ Voice Response/Processing
☐ 86. ☐ Dedicated Leased Line
☐ 87. ☐ Switched Data
☐ 88. ☐ Centrex
☐ 89. ☐ E-Mail/Online Services
☐ 90 ☐ Image Processing
☐ 91. ☐ Local Services
☐ 92. ☐ WATS/MTs
☐ 93. ☐ International
☐ 94. ☐ Virtual Networks
☐ 95. ☐ Frame Relay
☐ 96. ☐ Value Added Services
☐ XX ☐ None of the above(1-96)

6 What is the total number of A:LANs B:Workstations/Nodes In your organization?

	LANs A		Workstations/ Nodes B
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3	☐	100 - 999	☐
4	☐	50 - 99	☐
5	☐	10 - 49	☐
6.	☐	9 or less	☐

7 Which of the following network platforms are currently Installed/planned? (check all that apply)

NETWORK ARCHITECTURES

Installed Planned

A B

☐ 01. ☐ SNA
☐ 02. ☐ DECNET
☐ 03. ☐ MAP/TOP
☐ 04. ☐ TCP/IP
☐ 05. ☐ DCA (Unisys)
☐ 06. ☐ X.25
☐ 07. ☐ Novell IPX/SPX
☐ 08. ☐ APPC/APPN/LU6.2
☐ 09. ☐ NETBIOS
☐ 10. ☐ OSI

Installed Planned

A B

☐ 11. ☐ APPLETALK
☐ 12. ☐ OTHER__________

LAN OPERATING SYSTEM

☐ 13. ☐ LOCALTALK (APPLETALK)
☐ 14. ☐ BANYAN (VINES)
☐ 15. ☐ DCA (IRMALAN)
☐ 16. ☐ DCA (10-NET)
☐ 17. ☐ IBM (LAN SERVER)
☐ 18. ☐ IBM (PC LAN PROGRAM)
☐ 19. ☐ MICROSOFT (LAN MANAGER)
☐ 20. ☐ UNGERMANN-BASS (NET/1)
☐ 21. ☐ NOVELL (NETWARE,2X,3X,4X)
☐ 22. ☐ PROTEON (PRONET)
☐ 23. ☐ SITKA (TOPS)
☐ 24. ☐ 3COM (3+,3+OPEN)
☐ 25. ☐ ARTISOFT (LANTASTIC)
☐ 26. ☐ HAYES (LANSTEP)
☐ 27. ☐ DEC (PATHWORKS)
☐ 28. ☐ OTHER__________

LAN ENVIRONMENT

☐ 29. ☐ 4M TOKEN RING
☐ 30. ☐ 16M TOKEN RING
☐ 31. ☐ ARCNET
☐ 32. ☐ ETHERNET
☐ 33. ☐ STARLAN
☐ 34 ☐ FDDI
☐ 35. ☐ LOCAL TALK
☐ 36. ☐ 10BASE-T
☐ 37. ☐ OTHER__________

OPERATING SYSTEM

☐ 38. ☐ DOS
☐ 39. ☐ UNIX/XENIX/AIX
☐ 40. ☐ OS/2
☐ 41. ☐ OS/2 2 X
☐ 42. ☐ MVS
☐ 43. ☐ VM
☐ 44. ☐ VMS
☐ 45. ☐ MACINTOSH
☐ 46. ☐ WINDOWS
☐ 47. ☐ WINDOWS NT
☐ 48. ☐ X WINDOWS
☐ 49. ☐ SOLARIS
☐ 50. ☐ OTHER__________

8 For which areas outside of the U.S. do you have purchase Influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Which of the following hardware platforms are installed/planned In your company? (check all that apply)

	Mainframes		Minis	
	Installed	Planned	Installed	Planned
01. IBM	☐	☐	☐	☐
02. DEC	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09 UNISYS	☐	☐	☐	☐
10. OTHER __________	☐	☐	☐	☐

MICROCOMPUTERS
(fill in the numbers)

	INSTALLED	PLANNED
11. Macintosh 20,30,40		
12. Macintosh other		
13. PCs based on Pentium		
14. PCs based on 80486		
15 PCs based on 80386		
16. PCs based on 80286		
17. PCs based on 8086/8088		
18. RISC/Unix based wkstns		
19 Other		

10 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

1 ☐ $100 million and over
2. ☐ $50 - $99.9 million
3. ☐ $25 - $49.9 million
4 ☐ $20 - $24.9 million
5. ☐ $10 - $19.9 million
6. ☐ $5 - $9.9 million
7. ☐ $1 - $4.9 million
8. ☐ $500,000 - $999,999
9. ☐ $499,999 or less

11 Estimated gross annual revenues of your entire company/institution: (check one only)

1. ☐ Over $10 billion
2. ☐ 1 to $9.9 billion
3. ☐ $500 to $999.9 million
4. ☐ $100 to $499.9 million
5. ☐ $50 to $99.9 million
6 ☐ $10 to $49.9 million
7. ☐ $5 to $9.9 million
8 ☐ $4.9 million or less

12 Estimated number of employees for your entire corporation: (check one only)

1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3 ☐ 2,500 - 4,999
4 ☐ 1,000 - 2,499
5. ☐ 500 - 999
6 ☐ 499 or less

9401

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DOD's bid for network sends vendors building

BY ELLEN MESSMER

Washington, D.C.

The Department of Defense will be taking bids in mid-May for a secured electronic mail and directory network, setting off a rush among vendors to build new products expected to satisfy both the department's and commercial users' needs.

The Defense Message System (DMS) could end up as one of the largest contracts for Open Systems Interconnection-based routing and transport products, as well. But many vendors are doubtful about the Defense Department's commitment to OSI since the DMS request for proposal asks for both Transmission Control Protocol/Internet Protocol and OSI communications software.

Wanted: massive messaging net

The Defense Department's DMS RFP, which is intended to support nearly 2 million military users, states that vendors must be able to supply an X.400-based E-mail system that supports:

- TCP/IP and OSI transports, windowing, priority mail, large multimedia files, fax, autoforwarding and other features.
- Multiple operating systems, including DOS 5.0 and higher, Windows 3.0 and higher, OS/2, Unix, Windows NT and Macintosh.
- Digital signature and encryption technology based on Mosaic software and Tessera PCMCIA cards provided by the NSA.
- X.500-based directory services.
- Gateways to pure X.400, Simple Mail Transfer Protocol and Automated Defense Information Network E-mail systems.
- Management Workstation to manage DMS nets using CMIP, SNMP and/or SNMPv2.

GRAPHIC BY TERRI MITCHELL

Based on the 1988 X.400 and X.500 standards but modified for improved security, the Defense Department's messaging and directory applications will require users to authenticate their identity and electronically sign each message using public-key encryption. Software vendors said they are building products to satisfy the department's security needs, but these products will be marketed to the commercial sector, too.

"This is the biggest messaging contract that's ever come out," said Sara Radicati, president of The Radicati Group, a Palo Alto, Calif.-based consultancy. "It should tickle industry to do its best, and it will make a contribution toward advancing the state of the art."

The DMS will form the basis for the Defense Department's enterprise net, replacing the aging but secured Automated Defense Information Network, which requires a printout and hand delivery of military information. The DMS will be integrated into the department's future backbone net, the Defense Information Systems Network.

When officials at the Defense Information Systems Agency began talking about the DMS architecture more than a year ago, it was envisioned as a pure-OSI network. But converting to OSI would require swapping out a huge installed base of TCP/IP.

DMS is structured as a 10-year "indefinite quantity-indefinite delivery" contract, which lets the Defense Department buy as much as it wants at its own pace to bring secured messaging to two million military users in both the desktop and mobile environments.

And for vendors, the race is on.

"We're taking our current 1988 X.400 product and adding the security features to it," said Jeff Drake, national account manager at Enterprise Solutions, Inc. in Westlake Village, Calif., whose X.400 and X.500 software is used by The Boeing Co., Ford Motor Co. and Wal-Mart Stores, Inc.

Security for the DMS network is largely provided by Tessera PCMCIA crypto-cards developed by the National Security Agency. The cards hold both the Capstone public-key algorithm and the user's private key.

The DMS messaging software must be able to access the Tessera card to sign and encrypt the user's electronic documents as well as check incoming documents for integrity. The user's identity will be authenticated by comparing the Tessera card's private key with its matching public-key certificate stored in the X.500 directory on the DMS net.

Capstone is a key-escrow algorithm that lets the government unscramble messages encrypted with it. The key-escrow approach may not win favor with the private sector, so Enterprise Solutions will offer a variation on DMS software integrating support for other public-key technologies.

"The whole idea of client/server distributed systems will require network security," said Ron Elliott, director of systems integration for the U.S. Marine Corps.

Microsoft Corp. and Lotus Development Corp. are expected to bid as subcontractors on DMS, although both declined to comment. The prime contractors bidding will likely be Harris Corp., Computer Sciences Corp., Loral Corp. (formerly IBM Federal), Planning Resource Corp. and TRW, Inc.

The Defense Department will not let vendors Delta Research, MCR Services Corp., Mitre Corp., Science Applications International Corp., Sterling Software, Inc. and Validity, Inc. bid as prime contractors or subcontractors due to conflicts of interest with other government contracts.

Comments?

See "Contacts" box on page 2.

Hypercom adds to multifunction net devices line

BY MICHAEL COONEY

Phoenix

Hypercom, Inc. last week announced a low-end addition to its Integrated Enterprise Network (IEN) line of multifunction devices intended to ship SNA and LAN traffic between branch offices and corporate backbones.

Like its larger siblings, the IEN 1000 is a multifaceted box that comprises a router, hub, multiplexer, protocol converter, data service unit/channel service unit and dial backup modem in one unit. It lets users consolidate Systems Network Architecture and local network traffic on a single 56K bit/sec link.

"The IEN 1000 replaces as many as five separate products, which may come from five separate vendors, with one integrated box," said Paul Wickre, director of sales and marketing for Hypercom. "For the enterprise manager, the product eliminates any potential interoperability problems normally associated with mixing routers and hubs, and it is visible by NetView or any industry-standard SNMP manager."

The IEN 1000 supports the Routing Information Protocol and Open Shortest Path First routing protocols, and can route Transmission Control Protocol/Internet Protocol and SNA traffic.

In its basic configuration, it contains one 56K bit/sec wide-area port that supports frame relay, leased-line or X.25 services. It also has three local slots, which can support a combination of token-ring and Ethernet hub or router modules, or Synchronous Data Link Control connections. Each Hypercom hub module supports up to 12 devices. A maximum of two hubs or 24 users can be supported by the IEN 1000.

But the larger IEN 3000 and 6000 models support any combination of up to four T-1, 56K bit/sec frame relay or X.25 wide- area connections and six to eight LANs.

The IEN 1000 employs a combination of packet switching and time-division multiplexing to handle SNA and LAN traffic, just as the 3000 and 6000 do, although only the larger versions support voice transmissions.

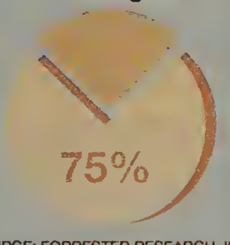
Analysts said the box could be attractive to small branch office users.

"Sixty percent of branch offices have 10 to 20 people in them, so the Hypercom box could be what they need," said Lynn Nye, president of NetResults, Inc., a consultancy in Los Gatos, Calif. However, it's not yet clear how simple the Hypercom and other integrated branch office networking devices are to work with. "Users should evaluate them carefully," according to Nye.

The IEN 1000 is available now. A typical IEN 1000 configuration with one wide-area network interface, an Ethernet router, one serial interface and one four-port Ethernet hub costs $3,800.

©Hypercom: (602) 866-5399.

More than 75% of the network planners who work at the largest 1,000 U.S. firms say they will stick with their primary hub or router vendor when they begin to implement remote branch office connectivity. Big players such as Cabletron, Cisco and Wellfleet will be the prime beneficiaries of such strategies.



SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Ki to fill another Digital mgmt. void

BY JIM DUFFY

Columbia, Md.

Ki Networks, Inc. has a remedy for Digital Equipment Corp. users that are uneasy about the minicomputer maker's future in network and systems management.

The company, based here, is developing an application for managing Digital VAXclusters from Hewlett-Packard Co.'s OpenView platform. Called VAX System Console Services (VSCS), the software allows users to stop, start, reboot and monitor the performance of their VAXclusters from a central management console.

VAXclusters are Digital VAX systems strapped together via a high-speed interconnect to attain higher performance levels of computing, sometimes equaling that of mainframes. They are prevalent in many VAX sites.

Ki's VSCS works with HP's OperationsCenter software on the OpenView console. OperationsCenter, which debuted from HP last year, is an application that receives event information from networked systems and initiates remedial action by launching other management applications.

One of those applications is now VSCS. The software allows users to graphically depict the logical grouping of VAXclusters on an OpenView map and view VAXcluster performance via OpenView color codes – green for up, yellow for marginal and red for down.

VAXclusters attached to an Ethernet network via a Local Area Transport terminal server issue periodic messages on their performance and function. VSCS, from an OpenView console also attached to the Ethernet, captures the most important messages and issues predefined commands back to the VAXcluster as necessary. Such commands include system reboot or shut down; running diagnostics; performing backup operations; installing layered applications; and viewing console output.

Messages not acted on are logged for historical recording.

VSCS is positioned as an alternative to Digital's Polycenter Console Manager for OpenVMS VAX Version 1.1, which is a replacement for the older VAXcluster Console System Version 1.4. That product is scheduled for retirement next month, according to Digital.

"Digital does weird things. They can choose to come out with a new product and we buy it, and then they kill it."

Polycenter Console Manager currently runs on Digital's soon-to-be-retired Polycenter Framework platform but is expected to be ported to Polycenter NetView, the replacement for Polycenter Framework. If Polycenter Console Manager users have to switch management platforms, Ki officials reason, why not switch to HP OpenView, which has garnered much more industry support?

Given Digital's recent moves in network and systems management, which many liken to a retreat, some users agree with Ki's logic.

"Digital does weird things," said Dave Coder, manager of technical services at the Chicago Stock Exchange. "They can choose to come out with a new product and we buy it, and then they kill it. Since Digital's killing [VAXcluster Console System] off this summer, we have to change to something. Do I change to another Digital product that I have no guarantee will live very long?"

VSCS will be available in August. Pricing has not yet been determined.

©Ki: (800) 945-4454.

INTERNETWORKING MONITOR

by Scott Bradner

The view from Seattle

The 29th meeting of the Internet Engineering Task Force (IETF) was held in Seattle the week of March 28. The weather outside was beautiful all week, using up, it was said, a significant portion of the annual quota of good days.

As you might expect, there was quite a bit of activity in the IP: next-generation (IPng) area. Allison Mankin and I gave a report on Monday morning about the status of the deliberations, and there were working group meetings all week, including an open directorate meeting on Friday.

The process is still on track for a July recommendation.

The chairs of the Address Lifetime Expectations working group reported that the year 2008, plus or minus three years, is their latest estimate of when the current TCP/IP address space will be exhausted. This should give adequate time to select and deploy an IPng.

The thinking behind that date assumes that there are no major shifts in usage paradigms, such as an electric utility deciding that it wants to assign network addresses to all major electrical devices in every U.S. household and have them globally accessible, which could cause a bit of a run on the available addresses. And I'm not sure I want you to be able to telnet to my bedroom air conditioner.

A draft of the IPng requirements document is now available, and all who would like to comment on it are urged to do so. The document is on hsdndev.harvard.edu in the directory pub/ipng/wp for anonymous ftp and gopher access. The file name is criteria.txt.

The other files in the same directory are responses from a request for requirement, which the area directors issued a while back, and make quite interesting reading. If you have comments on the draft requirements or the other documents, please send them to the big-internet mailing list. Send a message to big-internet-request@munnari.oz.au to subscribe to this list.

One of the things I've lamented about in the past on these pages is a lack of enabling technology — such as electronic data interchange — to extend the usefulness of the Internet to additional applications, particularly in business.

So it was good to see an EDI birds-of-a-feather session at the conference and even better to see a working group formed as a result, which will try to define ways to support the exchange of EDI documents using Internet mail. A draft standard could be ready in a few months.

The standard could, for example, let a company use the Internet to place an electronic order for office supplies and allow the supplier to send an electronic bill when the items have been delivered.

The current work is just a start on the transport of EDI over the Internet, but it is a welcome beginning that will enhance the business usefulness of this most general purpose of networks.

One positive thing about the EDI session was the number of attendees who were not normal IETF attendees (if ''normal'' is a proper term for an IETF attendee anyway). Quite a number of people attended who do most of their work in other standards organizations, ANSI X.12, for example.

This is a good development. The more that standards bodies can work together, the better we will all be.

Disclaimer (from C. Katzman): The opinions offered here are MY opinions and do not reflect anything formally from the university. My crystal ball can be affected by humidity.

➾ Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

Tivoli

Continued from page 17

tures transaction-oriented system management operations designed to ensure the same type of reliability and integrity as in large, enterprisewide on-line transaction processing environments. Such features include two-phase commits, the ability to perform parallel transactions and scheduling, rollback and retry capabilities.

The new platform also allows users to establish interconnected managed domains, whereby networks can be partitioned and managed locally, but management functions are delegated from a central ''super'' console. Domains can be configured geographically or by company department and users, for instance.

Scalability is a big reason Charles Schwab & Company, Inc. is adopting TME 2.0.

''Right now, going beyond 200 workstations is difficult unless you create another management region,'' said Michael Negatu, director of systems integration at the company. ''Scalability is a very desirable feature for us.''

TME 2.0 will be available in the third quarter.

Client applications for administration, software distribution, print services and event gathering are priced from $125 to $145. Server-based applications for backup and job scheduling cost $5,000 and $9,000, respectively.

The Tivoli/Enterprise Console costs $20,000 per management station. The event adapter tool kit is priced at $6,000 per user.

©Tivoli: (512) 794-9070.

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The PBS Adult Learning Satellite Service, in cooperation with the Computer Television Network and the Data Processing Management Association, is pleased to present a live, interactive videoconference on navigating the world's largest computer network.

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Ed Krol

Scott Yanoff

Ed Krol, author of *The Whole Internet User's Guide and Catalog,* and Scott Yanoff, compiler of two popular on-line Internet resource lists, will guide participants through a complete overview of the "network of networks" that is rapidly becoming the standard by which the information superhighway will be built. File transfer protocols, retrieval methods such as Archie and Gopher, and other topics will be covered, with plenty of time for hands-on exercises and call-in Q&A. If you want to understand better what's available on the Internet and how you can use it, don't miss this videoconference!

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THE LONG AND THE SHORT OF CHOOSING A ROUTER AS TOLD BY FIRST OF AMERICA.

THE SHORT OF CHOOSING A ROUTER AS TOLD BY PROTEON.

BOB FISHER is the Systems Analyst at First of America Services, Michigan.

THE LONG AND THE SHORT OF CHOOSING A ROUTER AS TOLD BY FIRST OF AMERICA.	THE SHORT OF CHOOSING A ROUTER AS TOLD BY PROTEON.
"Primarily, we evaluated four routers — Cisco, Wellfleet, CrossCom, and Proteon — for SNA internetworking, IPX and IP capabilities.	"No contest."
"When it came to hardware configuration, Proteon provided extremely easy access. You could pop the cover off and readily change interfaces without having to string a bunch of cables. They provided flash memory for the operating system and configurations, so there was never any booting off a diskette. The LEDs on the front panel were also very nice. A quick look would tell you whether a given interface was up or not. None of the other router vendors provided that. In terms of speed and efficiency, Proteon beat the others hands down. And as far as the overall support for different topologies, Proteon worked well with everything. Unlike other brands we tested, the Proteon router was a true gateway.	"Our router is incredibly easy to use."
"Reliability was another major criteria for selecting First of America's new router. You see, if we can't service our customers, we're out of business. Our network ties together six hundred bank branches. These terminals simply can't go down. So choosing a router to carry this traffic wasn't a decision I took lightly. Proteon proved to have the reliability we need. And if any questions did arise, Proteon's support representatives were readily available and very knowledgeable.	"Proteon's reliability is second to none."
"Our bank is in acquisition mode, so integration is critical. After any merger, we have to integrate new networks into ours while migrating their applications. Right off the bat, our routers have to support all kinds of topologies. By deploying the Proteon DNX router at regional sites, we were able to provide these locations with SNA support very quickly.	"We'll integrate any multiprotocol network."
"In terms of overall technology and performance, I'd have to say the Proteon router is absolutely the best."	"Amen."

proteon

For more details on the First of America story and our free Guide to Integrating SNA and Multiprotocol Networks, call 1-800-830-1300.

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BRIEFS

Sequent Computer Systems, Inc. of Beaverton, Ore., recently announced its next-generation Unix **symmetric multiprocessing servers.** The new Sequent Symmetry 5000 series comprises two models that both feature a scalable bus architecture and a four-node cluster capability for high availability.

The Symmetry 5000 SE20 supports as many as 10 Intel Corp. Pentium 66 MHz processors and the Symmetry 5000 SE60 supports up to 30 Pentium chips. Both systems run on Sequent's Unix 5.4-compliant operating system, DYNIX/ptx.

Both systems are available immediately. Pricing for the Symmetry 5000 SE20 begins at $171,000, while the Symmetry 5000 SE60 starts at $469,800.

Sequent: (800) 854-0428.

Digital Products, Inc. of Waltham, Mass., last week rolled out three new multiprotocol **print servers** that support all the client platforms on which Banyan Systems, Inc. is delivering its Enterprise Network Services products. Those clients include Apple Computer, Inc. Macintoshes and Unix clients.

The new Digital Products print server models — the NETPrint/104, NETPrint/200 and JETXPrint/104 — all concurrently support Transmission Control Protocol/Internet Protocol, Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) and EtherTalk transport protocols.

The NETPrint/104 and the NETPrint/200 are external print servers for Ethernet nets priced at $1,195 and $1,595, respectively. The JETXPrint/104 is an internal print server that installs in Hewlett-Packard Co. printers such as the LaserJet 4SI. It costs $995.

All of the servers are available now.

Digital Products: (800) 243-2333.

Hewlett-Packard Co. last week formed a new Storage Systems Division to focus on delivering products that address the **local-area network backup and storage** market for personal computer and Unix workstation-based networks. The first products to roll out of the new division, which will be based in Boise, Idaho, will be the HP Disk System and the HP Disk Array controller.

The HP Disk System is a storage subsystem with a modular design that includes support for hard-disk modules, digital audio tape drives and diagnostic components for management. This product also includes Redundant Array of Inexpensive Disks (RAID) software supporting RAID Level 3 protection. Pricing starts at $3,019.

The HP Disk Array controller fits into the back of an Extended Industry Standard Architecture server and supplies the connection to either one or two HP Disk Systems via two Small Computer System Interface-2 channels. A hardware RAID implementation, the HP Disk Array supports RAID Levels 0, 1, 5 and 6. It costs $2,699.

Both products are currently shipping.

HP: (800) 826-4111.

PROTOCOL ANALYZERS

Novell unveils enterprise-capable LANalyzer

BY CARYN GILLOOLY

San Jose, Calif.

Novell, Inc. last week brought out a new version of its network analysis tool that can monitor IBM and Unix systems, as well as high-speed local networks.

With LANalyzer for Windows 2.1 running on a NetWare LAN, network managers can now troubleshoot IBM mainframes and Application System/400 systems running on Systems Network Architecture networks as well as Unix workstations running the Network File System (NFS). The software can be used to monitor these types of nets either locally or from a remote location.

The new version of LANalyzer also will be able to monitor 100M bit/sec 100VG-AnyLAN and 100Base-T networks.

Previous versions of the product only let users troubleshoot Transmission Control Protocol/Internet Protocol-, Internetwork Packet Exchange (IPX)- and Apple Computer, Inc. AppleTalk-based nets. Also, only traditional Ethernet and token-ring topologies were supported.

Like the previous versions, LANalyzer for Windows 2.1 comes in several different forms. Novell's flagship network analyzer is a stand-alone combination hardware and software product for Ethernets and token rings that resides permanently on a single segment of the network. It lets the net administrator view a segment's status right there via a Windows interface.

LANalyzer lets the net administrator view a segment's status right there via a Windows interface.

LANalyzer decodes various networking protocols and provides the administrator with packet tracking and network traffic pattern information. The product also automatically discovers and diagnoses common networking problems.

The single-segment version of LANalyzer also is available in a software-only form that can be loaded onto a portable computer and taken to a remote site.

The new LANalyzer capabilities are also available on an enterprisewide basis through LANalyzer Agent software, a NetWare Loadable Module that resides on NetWare servers and is manageable with the central console of Novell's own NetWare Management System.

ENTERPRISE ANALYSIS

Users were excited to see the new enterprise capabilities.

"We run multiple protocols across a

See Novell, *page 26*

Banyan introduces new messaging engine

BY CHRISTINE BURNS

Atlanta

"Messaging" was the word at last week's Association of Banyan Users International (ABUI) meeting here as the company formally rolled out a new version of its messaging engine along with an E-mail client package to work with it.

Intelligent Messaging III is Banyan Systems, Inc.'s next-generation message transport engine. The software features a revamped database, which is more manageable than its predecessors, and better support for a variety of front-end electronic mail packages and mail-enabled applications.

Banyan also released BeyondMail 2.0 for Intelligent Messaging III, the first product based on Beyond, Inc.'s technology since Banyan acquired the company in February. BeyondMail 2.0 for Intelligent Messaging III is a suite of a messaged-based applications ranging from standard E-mail functionality to work flow capabilities that use rules-based routing technology.

"Banyan is heading in the right direction with this combination," said David Whitten, program director of office information systems at Gartner Group, Inc., based in Stamford, Conn.

Intelligent Messaging III offers much more in the way of mail management than most local net-based E-mail products on the market, Whitten added. Then again, Banyan really has to offer more since users are looking to the company for more than just NetWare replacement products, he added.

"[Users] want the value-add that will give them enterprise capabilities," he said.

According to Eugene Lee, director of product marketing at Banyan, the enhancements to the messaging database center on support for mail-enabled applications. "Before, the database was where you kept E-mail messages in folders," he said. "Now the database is where applications can get data itself or get instructions that lead to another part of the enterprise system where the information needed is stored."

The messaging database stores messages as objects that can be sorted in a variety of configurations and selected as one would query a typical relational database. The Intelligent Messaging III database lets developers build applications designed to access only those items in the message store that have certain attributes.

The specific management capabilities added to Intelligent Messaging III include the ability to provide system-generated

See Banyan, *page 26*

BeyondMail 2.0 highlights

Integrated support for Intelligent Messaging III's message store database.

▼

New built-in, rules-based functions for accessing and setting StreetTalk III attributes.

▼

Custom forms use new Intelligent Messaging III message attributes.

▼

Improved search performance.

▼

New Windows-based administration tool.

▼

Supports new, shared mailbox capability in Intelligent Messaging III.

▼

Fully compatible with existing BeyondMail for VINES.

Companies to enter RMON game

BY SKIP MacASKILL

Start-up Armon Networking, Inc. and Network General Corp. this week will roll out separate network analysis products that support the Remote Monitoring (RMON) Management Information Base (MIB).

Armon will roll out OnSite, a product line consisting of RMON management software and agents for token-ring and Ethernet environments.

Meanwhile, Network General will introduce its Foundation Manager for Windows package, an RMON tool representing the first fruits from the company's recent acquisition of ProTools, Inc. The new product features the first RMON support for token-ring nets from Network General.

The RMON MIB is an extension of the Simple Network Management Protocol MIB II that provides a standard method for locally tracking, storing and analyzing network management data and passing that information over to a central management console.

"There are a number of management tools available that provide an overall view of the status of the network, but RMON allows us to go one level deeper and really analyze what's going on in the network," said John Scot, information sys-

See RMON, *page 26*

IBM LAN software enables multimedia data delivery

BY CHRISTINE BURNS

Austin, Texas

IBM has unveiled new software that makes it easier for administrators to bring stored video and audio files to desktop users without overloading local-area networks.

IBM's Ultimedia VideoCharger software resides on a dedicated server that grabs multimedia files off LAN-based video file servers and delivers them to large numbers of end users via existing analog distribution network systems, such as cable television links.

The product also includes a set of client/server applications that let an end user control delivery of multimedia data from the desktop.

"With a straight LAN, it's difficult to get video to many users because of the physical LAN restrictions," said John Albee, brand manager for Ultimedia VideoCharger at IBM. "We've alleviated the problems of getting video on demand to a large number of clients by leveraging the analog technology, which is available in most educational, hotel, hospital and even commercial establishments."

Albee said an additional cost savings is realized because customers only have to install video decompression cards in the Ultimedia VideoCharger server and not on every client, as with a typical video-on-demand LAN setup.

Ultimedia VideoCharger consists of client and server software. The client software, designed for end users that need access to video and audio files, runs on OS/2 and Windows.

Clients request multimedia files via the Ultimedia VideoCharger server, which runs on OS/2-over-IBM LAN Server nets. IBM plans to add Novell, Inc. NetWare support.

The server software comprises resource manager and player components.

The resource manager receives video requests from clients and selects an available digital video player equipped with the correct decompression card for the video requested. The resource manager also accesses the video file stored on the token ring-based video file server.

The player component gives end users control of the video through either an IBM ActionMedia II DVI or Optibase Corp. PCMotion MPEG-1 video decompression card residing on the server. The player component takes compressed video from the video file server, decompresses the video via one of the adapter cards and then delivers the video to end users via the analog distribution system.

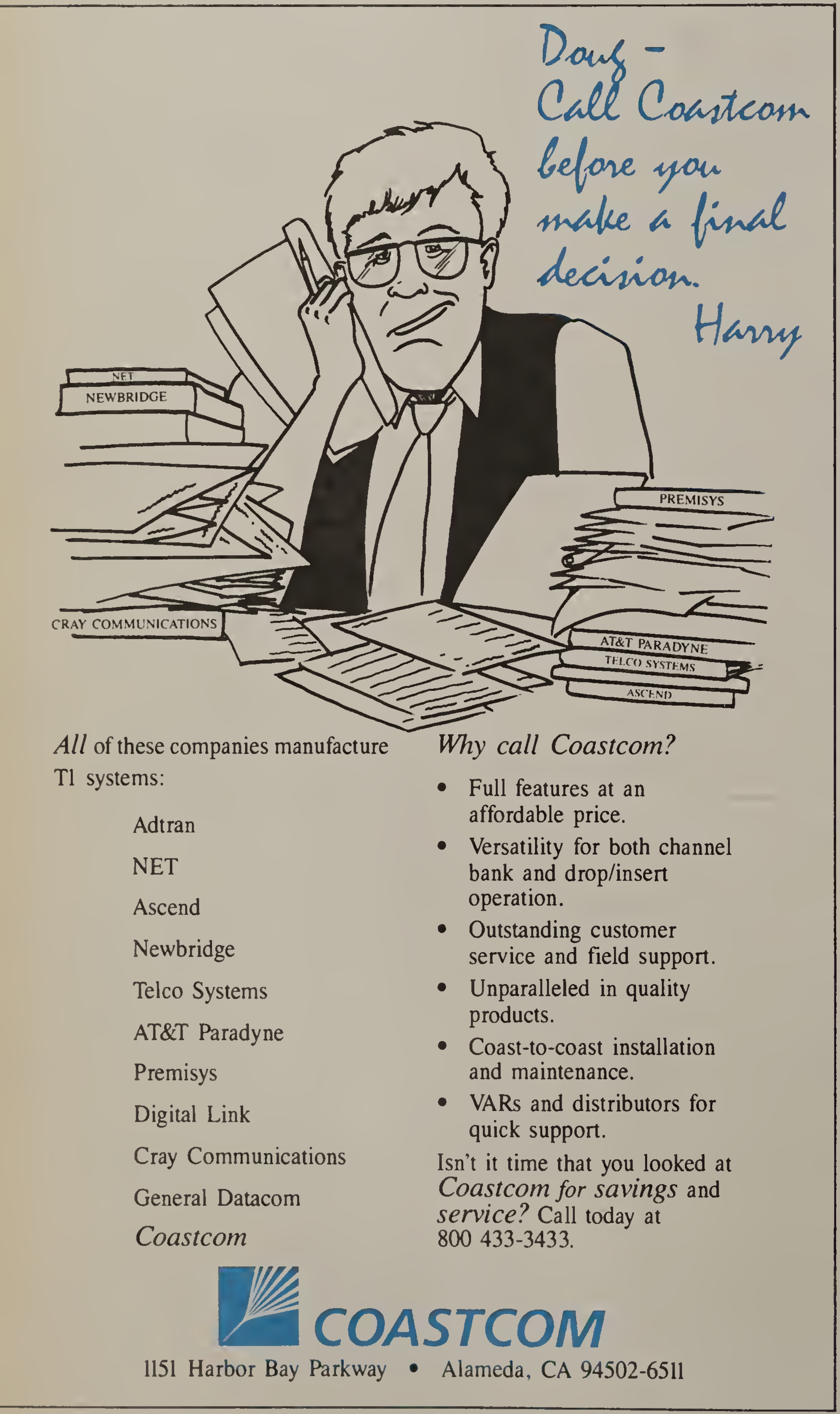
Client machines must be equipped with an IBM PS/2 TV or a similar type of device or adapter that can display video. The client software comes with a basic application that gives users a videocassette recorder-like control panel for selecting, playing, pausing and rewinding video clips.

©IBM: (800) 426-2468.

Charges for IBM's VideoCharger

- Ultimedia VideoCharger systems kit, which supports 10 concurrent digital video players: $2,950.
- Additional player kit, which supports 10 more video streams: $1,950.
- Client software: $25 per user.

*Will all be available April 29.



All of these companies manufacture T1 systems:

Adtran
NET
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Circle Reader Service #17

Beware of networked screen savers

Graphical software could generate LAN traffic loads.

BY JOANIE WEXLER

Flying toasters and tropical fish could be hazardous to your network's health.

So say consultants and integrators who have been troubleshooting network performance problems for clients whose Windows-based screen savers are created network-hampering traffic loads.

Screen savers are software programs that generate graphical, moving images to prevent personal computer screens from burning out when on but not in use.

Todd Stanford, a network engineer at network integration company Cohesive Systems in San Mateo, Calif., called the *Network World* Reader Advocacy Force hotline to report that he has identified the screen saver problem for three clients. He explained that in a networked configuration, Windows stores some program files, such as win.dll, on the network server, rather than on the individual PC's hard drive.

When the screen saver boots up, it accesses these files by reaching across the net to the server. With three or four PCs on a local net doing this, he said he has seen some Ethernets jump to near-80% utilization. Typically, efficient Ethernet utilization hovers around 30%.

Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J., said he recently pegged a bank's screen savers as the culprit behind mysterious net degradation problems. Traffic loads had reached the point where "people had started complaining."

The reason, he said, is that users tend to program their screen savers to boot up whenever their PC is idle. If a user is interrupted, say, by the telephone, the software loads a bandwidth-hungry, detailed bit map from wherever it loads Windows. If users are running Windows client software on the server to conserve local memory and disk space, the screen saver makes continual net calls to reboot.

"You must use critical judgment when creating a rich visual environment from a server," Nolle said.

Stanford said he actually measured screen saver-generated loads for his clients with a Network General, Inc. Sniffer protocol analyzer. He said he found the network complication largely with Berkeley Systems, Inc.'s After Dark and Disney Collection screen savers and has seen one instance of the problem with Delrina Technology, Inc. products.

Berkeley Systems support technician Rich Young acknowledged the screen saver impact when "the majority of Windows files are installed on a server." He said this is because the After Dark and Disney Collection products must continually access Windows' Dynamic Link Library (DLL) files — information files that link programs with the operating system. When making those calls to a server, screen savers "generate a lot of traffic," he said.

However, Berkeley Systems gets "relatively few calls on this," Young said. The degree of network-cluttering depends on configuration.

Disney dalmations chew up bandwidth.

As a safeguard, some users advise centrally administering distributed nets and not letting individual users install their own screen saver software. "We centrally manage our Windows environment and define and install the screen savers," making sure they interact properly with the Windows program files, said Jim Queen, director of enterprise networking at Enron Gas Services Co. in Houston. "Users aren't allowed to play with that stuff."

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Novell

Continued from page 23

broadband campus, however, before evaluating LANalyzer for Windows 2.1, we had no way of reporting traffic collisions or collecting statistical information about usage on the backbone," said Leon Wimbley, net administrator at the University of Nevada at Reno.

PRICE POINT

But equally important to users as the capabilities themselves is their availability in a low-priced product. Although LANalyzer for Windows 2.1 is not the first product to offer SNA or NFS decode capabilities, it is less expensive than most others.

"We selected LANalyzer for Windows because a hardware-based, $30,000 protocol analyzer was not a cost-effective solution for us," said John Billington, systems engineer at Memorial Healthcare System, a LANalyzer for Windows beta site in Houston.

LANalyzer for Windows 2.1 is available for $1,495. LANalyzer for Windows 2.0 users can upgrade to the new version for $250.

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Banyan

Continued from page 23

alerts for events such as low disk space on the messaging server, communications failures and performance degradations. Intelligent Messaging III also lets a network administrator query and monitor the engine, as well as receive and process alerts via Simple Network Management Protocol-based net management systems, such as IBM's NetView/6000, Hewlett-Packard Co.'s OpenView and SunConnect's SunNet Manager.

Intelligent Messaging III will be available June 30 for VINES and Enterprise Networking Services (ENS) for NetWare at a price of $1,495 per server. Lee said the messaging engine will be supported on other ENS platforms in the third quarter.

ON THE VINES

Separately, Banyan announced at the ABUI conference the next version of its VINES network operating system.

VINES 5.54 adds support for new server platforms, including IBM's Personal System/2 Server Model 9585 and the AT&T Global Information Solutions Model 3430. Also new is support for Small Computer System Interface adapters from Adaptec, Inc., Dell Computer Corp., DPT Corp. and Olivetti Systems, Inc., as well as LAN adapter cards from 3Com Corp. and Madge Networks, Inc.

VINES 5.54 will be available May 30. Pricing will range from $2,995 for a 10-user license to $14,995 for a 250-user license.

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RMON

Continued from page 23

tems support manager at Advanced Technology Laboratories, Inc., a Network General customer.

"By using distributed probes that report to a centralized manager, we also save a lot of time and money by eliminating the need to send technicians around with hand-held analyzers," he added. "With 34 subnets to watch, that's a significant capability for us."

Armon's OnSite Manager management console software runs on Sun Microsystems, Inc. SPARCstation Models 1 or 2 and interacts with RMON Probes.

The probes either take the shape of Reduced Instruction Set Computing-based hardware devices or software agents from Armon for local network-attached SPARCstations and a variety of internetworking devices such as routers and hubs.

Any device loaded with the OnSite Probe software functions as an RMON agent, compiling network traffic and performance statistics from all devices on a LAN and passing that data on to the OnSite Manager for analysis and report generation.

The hardware-based RMON Probes from Armon are available in Ethernet and token-ring versions and support as many as four network interfaces.

OnSite Manager costs from $4,000 to $9,000. The Ethernet hardware probes cost $1,875 per segment, while their token-ring counterparts cost $2,000 per segment.

FOUNDATION MANAGER

Network General's Foundation Manager consists of management console software, software-based Cornerstone Agents that run on any Intel Corp. 80486 or higher personal computer running Windows, and Cornerstone Probes, which are server-based RMON agents. The probes and agents compile traffic information on the LAN to which they are attached and send that data to the RMON management console for evaluation.

Foundation Manager, which is available for both Ethernets and token rings, costs $5,995. The agents and probes are priced at $1,550 and $3,495, respectively.

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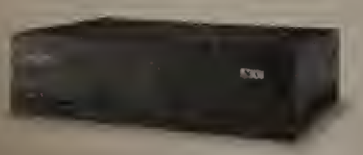

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Circle Reader Service #6

NET RESULTS

by Mark Gibbs

A day in the life of the road 'worrier'

On the seminar tour that I am doing for *Network World,* I'm in a new hotel roughly every three days.

And one of the things that has struck me as I travel from city to city is the impact that communications technology has had and, more to the point, where it has been overlooked.

In my travels, I have marveled at several implementations of communications technology.

Talking cola vending machines that thank me for my purchase and telephones in airplanes are two of my favorites. The former is always good for a chuckle, while the charge rate for the privilege of using the latter upholds that noble tradition of highway robbery.

But the lapses! There is nothing that will make you appreciate your corporate LAN as much as trying to do even the most simple communications when you are on the road. For example, I just checked out of a hotel where the switchboard wouldn't pass any signal at a higher rate than 1,200 baud. That's a problem for me because in the Doing Business on the Internet seminars I'm conducting, I need to demonstrate the delights of tools such as Mosaic. But when using a Serial Line Interface Protocol connection, 9,600 baud makes Mosaic seem grindingly slow.

The hotel didn't actually tell us this critical information when we booked. We said we wanted a phone line in the conference facility, and the hotel representative said, "No problem." When I checked in, I went to my room and tried to pick up my Internet E-mail. That was when I discovered the problem.

At first, I couldn't believe that the limitation was with the hotel equipment. For goodness sake, the telephone even had a modem socket. But it turned out that the restriction was in the hotel's private branch exchange system and applied not only in the hotel guest rooms, but in the conference facilities, as well.

The only solution seemed to involve about 100 feet of wire to connect the hotel's fax line — the only line the hotel staff knew of that didn't go through the switchboard — to a spare pair on the hotel's internal telephone wiring. Another 100 feet of wire was needed to run from the second-floor telephone panel to the conference room.

In short, it was looking to be a nightmare. There would be plenty of opportunities for the hotel staff, the seminar attendees and myself to trip over cables, break limbs and disconnect the whole mess.

Just before I was about to rush out and buy cable, a socket was discovered. In the hotel's prehistory, a line had been brought in for some reason to the conference room, and although it should have been disconnected, it was live. Saved at the 11th hour.

At a previous hotel, I was told that the conference rooms had just been refurbished (as it turned out, the room was redone in muted shades of green and cream — it looked like we were inside a compost bin). But there was no telephone line available, and we wound up having to get one installed by the local telephone company.

On the whole, hotels are really very behind the times technologically. With so many computer-equipped executives traveling these days, it surprises me that hotels haven't become more sophisticated in communications technology.

I'm sure I'm not the only one who has suffered through the vicissitudes of communicating while on the road.

If you have any horror stories, I'd really like to hear them.

Anyway, I'm now in Dallas and past the point of no return on the tour. Who knows what other telecommunications problems I'll find. I hope there will be none, but there are four cities and eight seminars left to do.

That's more than enough opportunity for a hotel telephone system to sabotage a seminar. Thank goodness hotels have bars that work.

➾Gibbs is a consultant and writer based in Ventura, Calif. He can be reached at (805) 647-2307 or on the Internet at mgibbs@rain.org.

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Circle Reader Service #5

Switched virtual circuits: not necessarily nirvana

BY JOANIE WEXLER

PRIMER

Companies looking forward to the on-demand connectivity of switched virtual circuits (SVC) are still waiting for carriers to offer the services. Meanwhile, SVC issues are emerging that could tempt users in the direction of other options that provide similar benefits.

SVCs will one day allow a user on a fast-packet network to communicate at will with anyone else on that network without predefining routes. The perception is that this will bring the cost-efficiencies generally associated with switched services and broaden a user's pool of communications partners.

Implementors' agreements for frame relay SVCs fell into place in January (*NW*, Jan. 24, page 1). SVC agreements for Asynchronous Transfer Mode (ATM) nets are expected to follow shortly, as the specifications are similar (*NW*, March 28, page 41).

SVCs will give users an alternative to permanent virtual circuits (PVC), which require net administrators to decide beforehand who each user can communicate with. Since PVCs demand a flat monthly fee, they are perceived as prohibitive for occasional communications.

Not necessarily, though, analysts and vendors said. Depending on how PVCs and SVCs are tariffed, they said it could be less expensive to install low-speed PVCs even for routes with infrequent traffic.

"WAN designs today are largely a result of tariffs," not technology, said Stephen Kelly, manager of product marketing at Cascade Communications Corp. Cascade makes switches that support ATM, Switched Multimegabit Data Service and frame relay, and recently outfitted its gear with frame relay SVCs.

Tariffs could also mean that choosing dial-up access into the carrier net via switched 56K bit/sec or

See SVCs, *page 34*

Bear in mind...

Both carriers and router makers must support SVC signaling for users to get service, but none of them has committed to a time frame.

◆

With today's routing algorithms, SVCs would stay up continuously, defeating the purpose of on-demand connections. Alternatively, users could manually configure their routers each time they bring up an SVC.

◆

Next Hop Resolution Protocol would technically alleviate the above problem, but it will be at least a year before routers support it.

How much should you know?

A common refrain among telecommunications managers turning to public services these days is that they don't care how their traffic gets delivered as long as it does.

"I couldn't care less what the technology is," said Douglas Williams, senior vice president and technology executive at Chase Manhattan Bank, N.A. The bank recently outsourced its network operations to AT&T.

"If the price is right and the service is right, whether they use ATM, frame relay or low-speed asynchronous lines is irrelevant to me."

But others argued that purchasers of fast-packet services must be knowledgeable about technology and their carrier's underlying platform to measure their service levels — more so than with simpler, less flexible technologies of the past.

For example, with T-1 service — which is strictly a provision of bandwidth — the quality of service is implicit, said Thomas Nolle, president of CIMI Corp. But uneducated users will find it tough to determine if they're getting what they contracted for with fast-packet nets because of the myriad optional factors making up the total net — such as access and port and PVC speeds.

Customers should understand their carrier's platform, including how it supports bursting, packet discarding and congestion, so they can measure if the carrier is living up to its contract, he said.

WILLIAMS

Dugal Easton, chairman of the Tele-Communications Association user group, said how intimate a user should be with the technology depends on "how far you want to go in ownership vs. just buying the service."

He said, though, that it could behoove the user to make technology choices himself, "especially while we're on the brink of true competition in the local area."

BY JOANIE WEXLER

BRIEFS

At the **Electronic Messaging Association** show in Anaheim, Calif., this week, **CE Software Holdings, Inc.** will demonstrate a prototype of electronic mail software — dubbed En Route — that wirelessly enables the Apple Computer, Inc. **Newton** personal digital assistant.

The wireless capability will allow users of CE Software's QuickMail local-area network software to link back to their QuickMail LANs over the **RAM Mobile Data** packet-data network, according to a CE Software spokeswoman. To date, the Newton's wireless capabilities have been limited to the **Metricom, Inc.** network.

Deutsche Bundespost Telekom is set to provide low-speed **Switched Multimegabit Data Services** in major metropolitan areas in Germany. The country's telecommunications administration has contracted for **Cascade Communications Corp.** switches to provide the service, Cascade said last week.

Deployment is to begin this month in Munich, Berlin, Frankfort and Cologne, Germany.

Dallas-based **AnswerSoft, Inc.** announced a product using the application program interface for Novell, Inc.'s **NetWare Telephony Services.** The product, called SoftPhone, offers such features as call screening; unified viewing of electronic mail, facsimile and voice messages; and association of documents with callers using automatic number identification.

AnswerSoft was one of the original third-party software developers announced in Novell's computer telephony program.

Telco Systems, Inc. last week said it will make available to carriers this fall multiplexers that integrate **T-1** and data-oriented **Asynchronous Transfer Mode (ATM)** services over a single **Synchronous Optical Network (SONET)** connection. The idea would be to allow carriers to provision T-1 services with an upgradable service, the company said.

One beta-test site, alternative access carrier **MWR Telecom** in Des Moines, Iowa, said that "combining LAN connections with DS1 multiplexing over fiber allows us to get more out of existing bandwidth." He indicated that those economics would be passed along to customers.

LOCAL COMPETITION

Bank buys access from unlikely source

BY DAVID ROHDE

Columbus, Ohio

While long-distance carrier MCI Communications Corp. has announced plans to provide local access service, National City Bank is already getting the service from another interexchange carrier.

LCI International, Inc. provides a T-3 dedicated access line over fiber-optic cable it laid itself between its point of presence (POP) here and National City Bank's data center.

The T-3 line, capable of carrying traffic at 45M bit/sec, at first supported bank traffic that represented the equivalent of four T-1 lines — well below the T-3 maximum, equivalent to 28 T-1s.

But because National City Bank did not have to pay another carrier to support the local link, such as Ameritech or a competitive access provider (CAP), it was a cost-effective solution.

Although he would not give specific dollar figures, Ken Kuhl, vice president and general manager of net engineering and design for the bank, said five to six T-1s from Ameritech cost the same as one T-3 from LCI.

"Within six months we were paying less money than we would have been paying with Ameritech," Kuhl said.

Now the T-3 link carries the equivalent of 14 T-1 lines, further boosting the bank's savings.

"We've [provided local access] in other locations in the Midwest," said Ken Shomaker, LCI's vice president of engineering and operations. "We're looking at it throughout the country."

LCI has been making a concerted effort to shed its image as a Midwest regional carrier. It recently relocated its headquarters from Dublin, Ohio, to the Washington, D.C. suburb of McLean, Va. The company also plopped down $2.8 million to purchase a network switching center in Los Angeles from T. M. Sepulveda, Inc., a small long-distance carrier in Southern California.

Ameritech, which operates a fiber ring downtown here, cites local geography as the reason National City Bank could not get fiber to its door. "Our fiber ring does not extend to the west side of the [Scioto] River," a spokesman said. And the carrier could not cost-justify extending it.

LCI officials said satisfying the customer overrode its own cost considerations. Installing fiber typically costs $50,000 to $70,000 per cable mile, Shomaker said.

Shomaker cautioned that not all LCI customers can get custom-built dedicated access lines just for the asking. But the carrier will explore other dedicated access options with customers, including digital microwave communications, he said.

For route and carrier diversity, the bank also obtained a T-3 link from MetroComm AxS L.P., a local CAP half-owned by Time Warner, Inc.

The MetroComm access line carries principally MCI traffic in the traditional CAP handoff to a Big Three long-distance company. MetroComm and LCI work together to reroute traffic within 15 minutes in case of a cut in either link, Kuhl said. ◻

RATE & TARIFF MONITOR

by Eric Paulak

Look who's calling

Have you ever wanted caller ID or automatic number identification (ANI) service but thought they were too expensive? Well that's all likely to change due to an FCC order mandating nationwide availability of caller identification next year.

The order precludes local and long-distance carriers from charging for interstate services.

But in typical fashion, the FCC has issued an order that is a double-edged sword. On one hand, it should push deployment of Signaling System 7 (SS7) technology and the advanced features that come with it because caller ID is only offered from central office switches that support SS7.

However, the order preempts some state laws and uses language so ambiguous that it leaves the issue of paying for caller ID up in the air.

Currently, caller ID is available only in local calling areas where states have okayed the service.

The only long-distance caller ID service is ANI, which is available on a charge-per-call basis on incoming 800 calls that originate and terminate through SS7 switches.

Under the FCC report and order (Docket #91-281) issued in late March, caller ID would be available April 12, 1995 on all interstate telephone services, and neither local nor long-distance carriers would be permitted to charge for delivery of the calling party's phone number.

Does this mean long-distance carriers won't be able to charge for ANI services as they do now? AT&T, MCI, Metromedia/LDDS and Sprint all charge 1 cent per ANI call.

The FCC says, "The costs of interstate transmission of [calling party number] are so small that the CPN should be transmitted among carriers without additional charge."

But the order doesn't specifically address existing caller ID or ANI services, so nobody knows for sure if carriers will still be able to charge for them.

As a result, neither MCI nor AT&T are commenting on the decision until their respective teams of lawyers pour through the documents.

If the order is determined to cover ANI services, that would mean significant savings for users. An inbound call center that handles 150,000 calls per month would save $1,500 per month or $18,000 per year.

It would also mean a big loss of revenue for the carriers. If that happens, you can expect a lawsuit from the carriers challenging the decision.

You can probably expect a suit from several states, as well. The move by the FCC would preempt several state laws and public utility commission regulations banning caller ID. Pennsylvania, for example, has deemed caller ID an illegal wire tap and has barred it on all intrastate calls.

The FCC order only covers interstate calls, so the Pennsylvania law will still stand. But if someone makes a call from Philadelphia to Chicago, Bell Atlantic of Pennsylvania will have to pass the CPN information to a long-distance carrier, which then has to pass it on to Ameritech.

For states like Pennsylvania it comes down to a question of privacy.

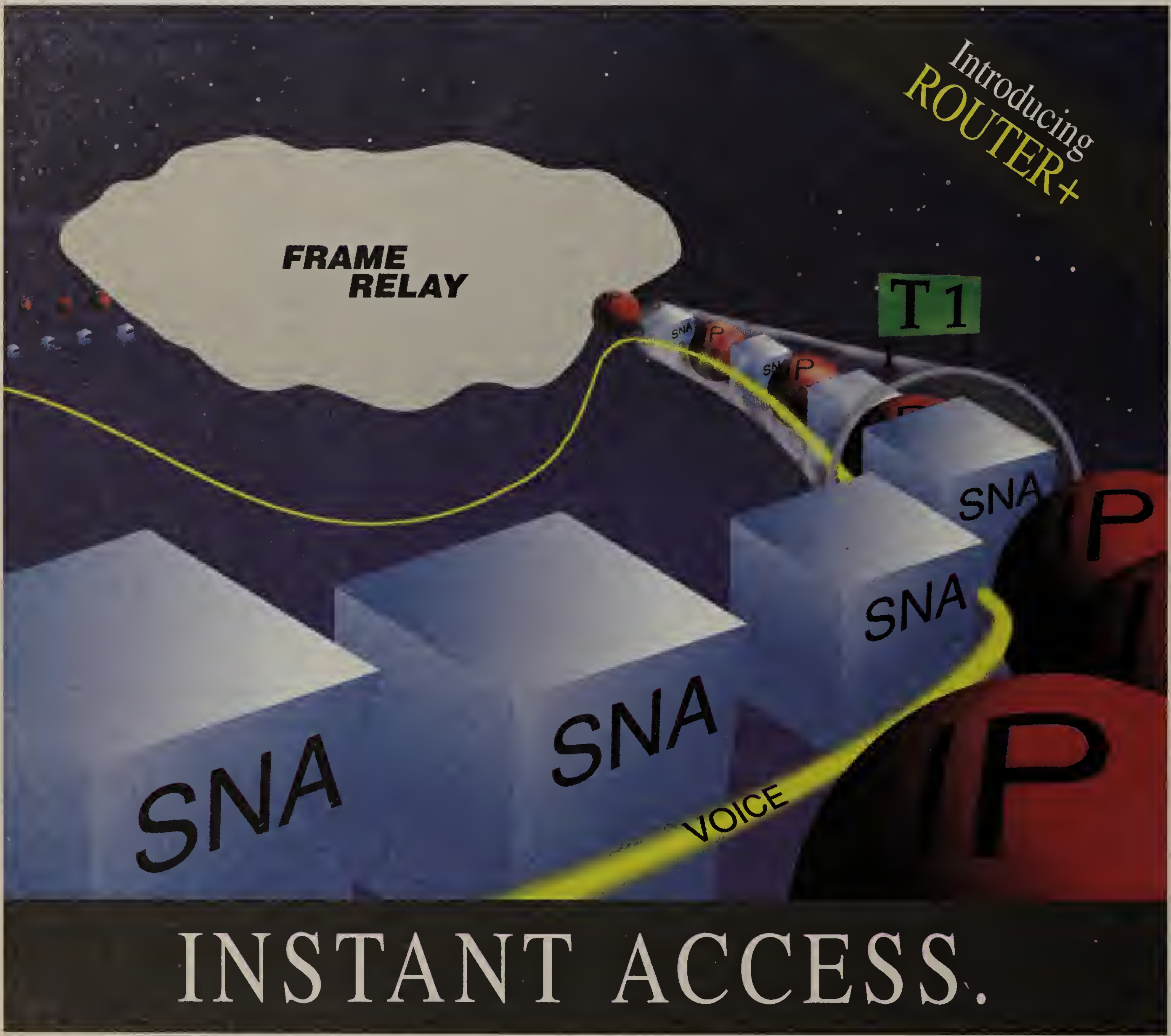
In response, the FCC has proposed requiring all carriers to allow free per-call blocking of caller ID by letting callers punch in *67 before each phone call.

Many states already offer this service free of charge, and some also require free per-line blocking of caller ID information. This may be a service the FCC also requires to be made available, but not for free.

In the meantime, if you want to block your own number from being captured by someone else, program your PBX so that *67 is transmitted before every call. Until there is per-line blocking, it's your best bet.

The FCC decision was the final report and order. So unless there is Congressional pressure or sudden consumer concern, the plan should go into effect on schedule and as written. Tariff revisions should come sometime in March 1995.

➻ Paulak is associate publisher for the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 327.



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Circle Reader Service #4

US West to try its hand at local E-mail service

BY BILL BURCH

Denver

US West, Inc. next month will launch an electronic mail store-and-forward service targeted at businesses that want discount transport within metropolitan areas.

Just out of alpha test, the carrier's Interact Message Switching Service will launch in Minneapolis/St. Paul on May 16, with service planned for other areas in the US West region as demand warrants.

The service allows users to dial in to a US West mail server and upload messages that are delivered when the recipient dials in to retrieve them. Dial-up connections run at up to 14.4K bit/sec; the carrier has also tested frame relay and private lines, and will support those links as demand warrants.

US West's service is intended to support a number of local-area network-based E-mail packages. The service can perform protocol conversion between Lotus Development Corp.'s cc:Mail, Microsoft Corp.'s Microsoft Mail and CE Software, Inc.'s Quickmail, as well as DaVinci Systems Corp.'s eMail and other Novell, Inc. Message Handling System (MHS)-based packages.

X.400 and Simple Mail Transfer Protocol support is planned for the fourth quarter, and an Internet gateway is also on tap, said Christopher Coles, general manager of US West's Interact Services group.

Wider connectivity via the Internet and other public messaging systems is a must for the service, according to Mike Rothman, an analyst with META Group Inc. in Reston, Va. "That's the key piece of the offering," Rothman said. "I don't view mail connectivity between a couple of LAN-based systems on a regional basis as too compelling."

Although the carrier is hedging its bets with a slow service rollout, US West's Coles hopes to build communities of users among small businesses not targeted by larger carriers. And by staying local, the carrier will be able to offer lower rates than international carriers that must back-haul messages to central distribution points, Coles said (see graphic).

E-mail transmission fees*

	Volume (bytes)	Cost
US West	Up to 5K	15 cents
	5K to 40K	3 cents per K byte
	More than 40K	2 cents per K byte
MCI	Up to 500	50 cents
	Next 500	10 cents
	1K to 10K	10 cents per K byte
	More than 10K	5 cents per K byte

* Prices do not include onetime setup fees and recurring monthly service charges.

"We're pricing to attract the larger messages, as well as the short interpersonal messages," Coles said. With those lower bulk rates, US West is hoping small businesses will be able to append large files to messages, essentially letting them use the service for file transfers.

That sounds like a good idea to David Coursey, editor of "P.C. Letter" in San Mateo, Calif. Currently, file transfers over MCI Mail are expensive, and transfers over the Internet can be less than user-friendly, he said.

Although CompuServe and other value-added network suppliers already have MHS-based messaging hubs, a local market could develop for an E-mail service that can handle protocol conversion, according to Coursey. ◪

SVCs

Continued from page 29

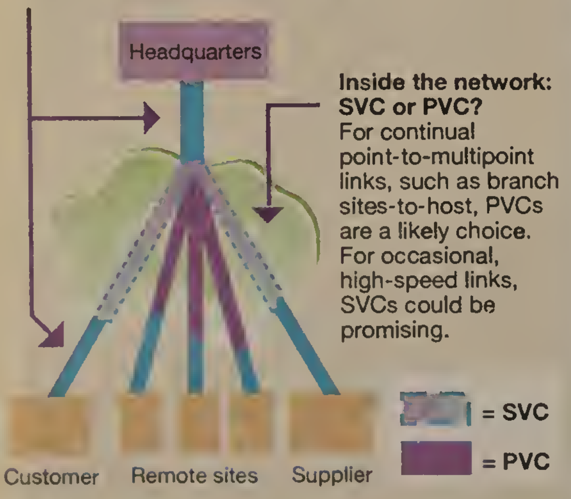
Integrated Services Digital Network links – rather than dedicated circuits – will provide enough cost-efficiencies to justify PVCs, said Kevin Brand, AT&T InterSpan's frame relay product manager. He estimated that access accounts for 50% of the total cost of a frame relay installation, with port and PVC costs inside the net accounting for the rest.

Users should also note that there is a call setup time associated with SVCs, which could affect response time.

Two-part decision

The "switched" in switched virtual circuit (SVC) refers only to links inside the public carrier cloud, not to access lines. Because access can represent 50% of the total cost of a fast-packet network, whether those links are dial-up or dedicated is a significant decision.

Access: Dedicated or dial-up?
If you need constant bandwidth of at least 56K bit/sec or must burst at those speeds, choose dedicated. For occasional or low-speed access, dial-up could be less expensive.



Inside the network: SVC or PVC?
For continual point-to-multipoint links, such as branch sites-to-host, PVCs are a likely choice. For occasional, high-speed links, SVCs could be promising.

GRAPHIC BY TERRI MITCHELL

SOURCE: AT&T, BASKING RIDGE, N.J.

SVCs also add a dimension of complexity to fast-packet networks that already offer many options and pose a challenge to users wanting to gauge whether they are getting the service levels they contracted for, said Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J.

These issues will remain moot, however, until carriers implement SVC services – a move they cannot make until customer premises equipment vendors, such as router makers, implement SVC interfaces on their devices. Router heavyweights Cisco Systems, Inc., Wellfleet Communications, Inc. and 3Com Corp. remain noncommittal on this issue (*NW*, Feb. 14, page 25).

Wellfleet's David Yates, director of product marketing, said one reason is that today's routing algorithms such as industry-standard Open Shortest Path First presume a predefined connection and cannot operate in an SVC environment without the SVC staying up continuously. "This means that, in effect, you have PVCs," he said.

Users can get around this by creating static routes, whereby the network administrator manually configures an SVC route, rather than relying on the router to dynamically find the receiving device. "But this reduces the value of internetworking," Yates said.

Cisco's director of wide-area networking, Morgan Littlewood, on the other hand, said hope is on the way in the form of the Next Hop Resolution Protocol (NHRP) under construction by the Internet Engineering Task Force.

The NHRP is being designed specifically for SVC networks so routers can dynamically download an unknown recipient's address from a public route server and determine the best route to that address. He said the protocol should be complete later this year. ◪

MCI promises smooth transition for BT users

Analysts predict merger of X.25, frame relay nets.

BY BILL BURCH

Washington, D.C.

MCI Communications Corp. last week sought to assure customers of BT North America, Inc. – officially acquired by MCI in February – that service changes will be minimal as the two companies' network operations are integrated.

MCI plans to detail its integration strategy for BT North America's X.25, frame relay and other data services at the NetWorld + Interop 94 conference in Las Vegas next month.

While MCI declined to discuss that strategy last week, the company said no major service, billing or pricing changes are in store for BT North America customers that have become MCI customers.

This is a relief to Bill Branson, a senior network engineer with Frank Russell Co. in Tacoma, Wash., which has used BT North America's international frame relay services for about 18 months. When he heard about the sale, Branson was worried that he'd lose his BT North America sales representative.

"The sales rep we've had has done an excellent job of shielding us from things going on behind the scenes, and I didn't want to have to go retrain somebody," he said.

Paul Weichselbaum, MCI's vice president of data marketing, said it has not yet been decided if MCI will merge the BT North America net with its own. But analysts report that MCI has indicated it may migrate both nets to a new infrastructure. At any rate, users satisfied with offerings such as BT North America's GNS LAN Interconnect frame relay service will see little change.

"We are very sensitive to preserving the service attributes that influenced customers to purchase [BT service] in the first place," Weichselbaum said. "We have kept the sales, support, operations, engineering, network management and marketing functions intact for the services we acquired through BT."

Some analysts said MCI's decision to preserve BT North America's frame relay net, which is based on StrataCom, Inc. equipment, reflects weaknesses in MCI's own infrastructure. MCI's frame relay net is based on switches from Siemens Stromberg-Carlson and Wellfleet Communications, Inc.

"What this suggests is that MCI is aware it cannot guarantee the same service attributes to current BT customers if it switches BT customers to its platform," said Thomas Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy.

The MCI platform has been criticized because the connectionless orientation of the Wellfleet equipment means delay is unpredictable, giving the user and carrier no opportunity to define performance parameters. Also, use of a full-frame switching scheme – switching an entire frame at a time instead of breaking frames into smaller pieces – increases delay, he added.

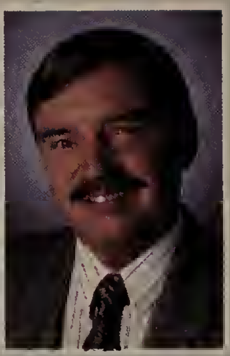
MCI recently announced plans to expand its frame relay service to 16 countries that map closely to those supported by BT North America's frame relay net. With the two coextensive networks, MCI is well positioned to absorb the BT North America offering and run both services off a single platform, said Jennifer Pigg, director of data communications at The Yankee Group, a Boston-based market research firm.

MCI's integration plans will not end with merging the frame relay nets; they also will involve bringing the BT North America X.25 network onto MCI's networks, she said.

Any changes MCI makes regarding X.25 and frame relay network integration will come slowly, said Joe Noel, general manager for telecommunications services at IntelliQuest, Inc., a consulting firm in Austin, Texas.

MCI will need to upgrade a number of its existing 56K bit/sec nodes to T-1 nodes to support the increased number of users and network traffic. It could take MCI as long as two years to transfer BT North America's X.25 users to a consolidated net, Noel added.

> We are very sensitive to preserving the service attributes that influenced customers to purchase [BT services] in the first place."
>
> **Paul Weichselbaum**



> This suggests that MCI is aware it cannot guarantee those same service attributes to current BT customers with its own frame relay platform."
>
> **Thomas Nolle**

⇒ Senior Editor Joanie Wexler contributed to this story.

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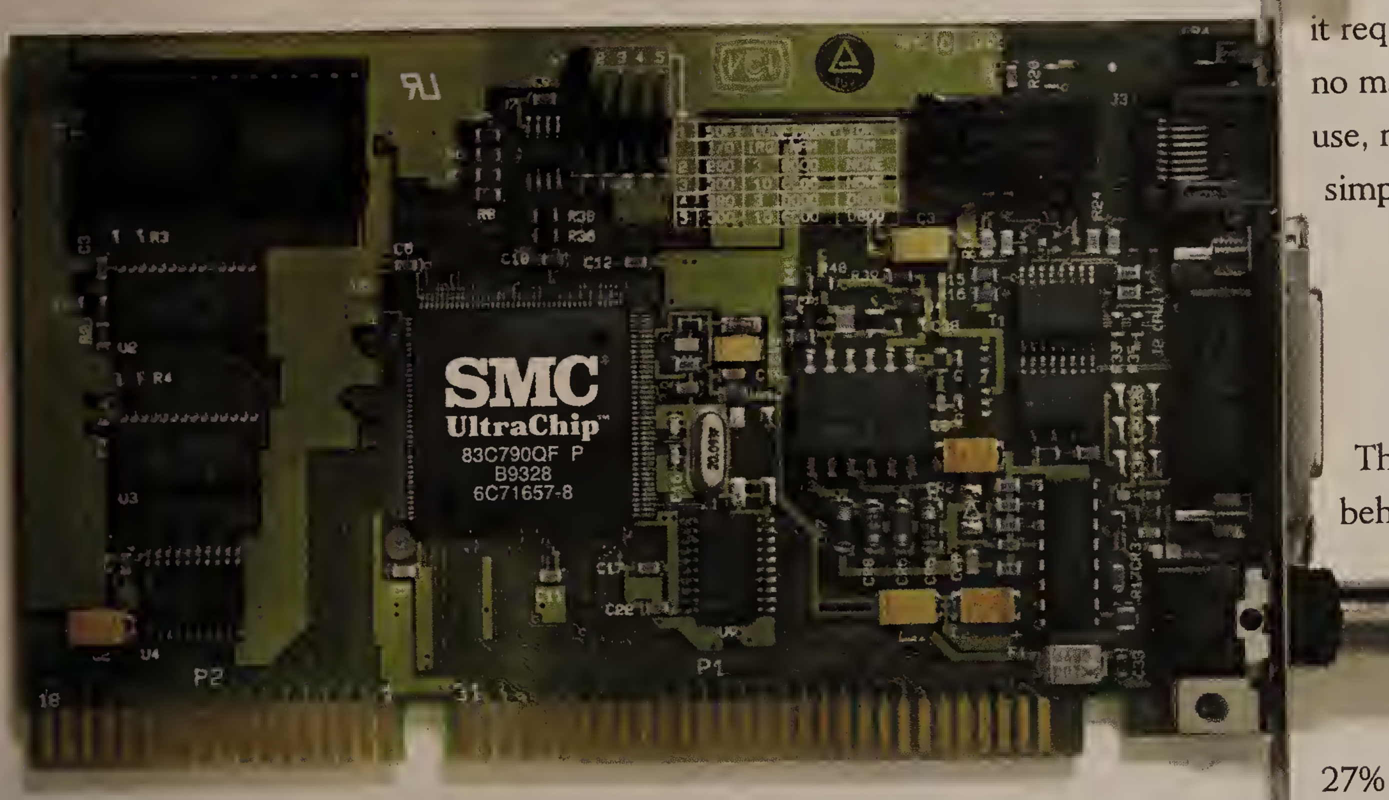

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Circle Reader Service #20

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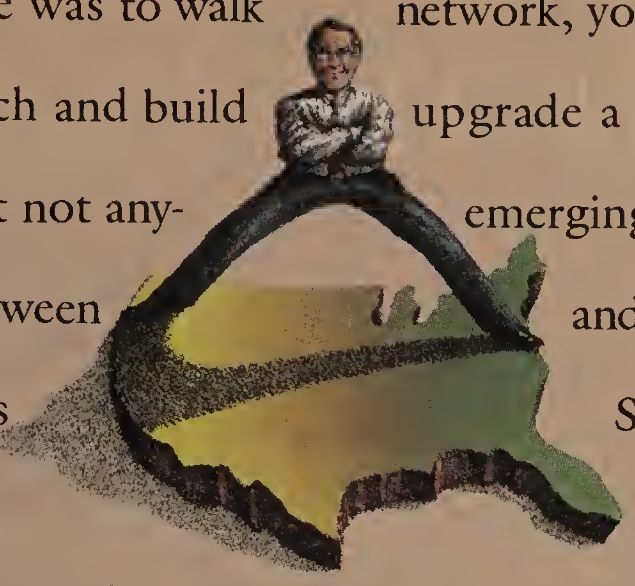

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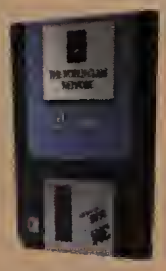

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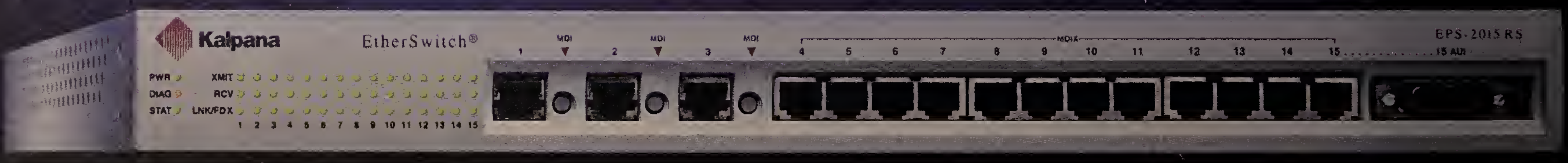

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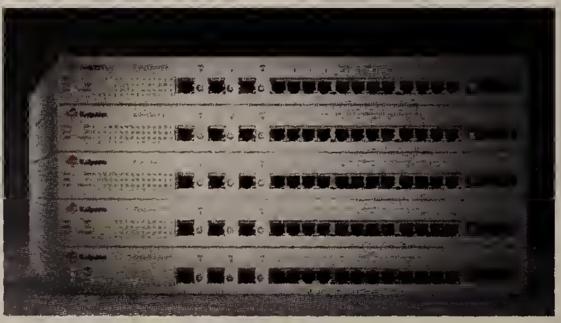

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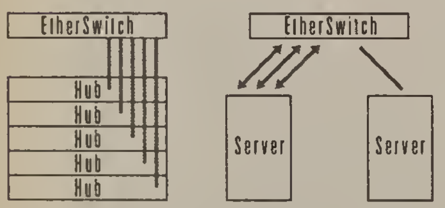

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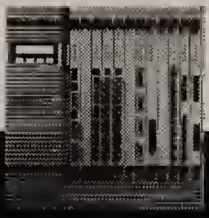

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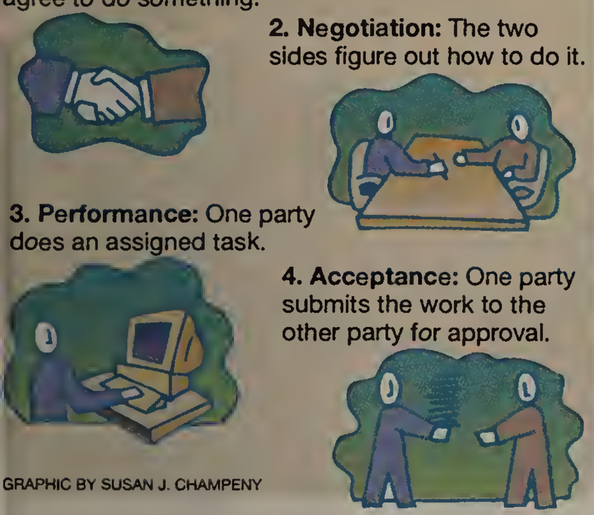
Taking Action

Action Technologies' work flow software builds on a four-step model that the company said describes most human interactions.



1. Preparation: Two parties agree to do something.

2. Negotiation: The two sides figure out how to do it.

3. Performance: One party does an assigned task.

4. Acceptance: One party submits the work to the other party for approval.

GRAPHIC BY SUSAN J. CHAMPENY

Action takes on new version for Windows NT

Y ADAM GAFFIN

Alameda, Calif.

Action Technologies, Inc. today will announce a ew version of its work flow software for Windows NT ervers, including those running Microsoft Corp.'s QL Server database.

The new version of ActionWorkflow System will nable users to take advantage of Windows NT's secuity features, while using SQL Server to store the rout ig and application data needed to run work flows cross a network.

Previously, the Action software ran only on OS/2 ervers, supporting the OS/2 version of Microsoft's nd Sybase Inc.'s SQL Servers.

Shirish Hardikar, director of marketing at Action, iid putting the software on Windows NT gives users nother choice. He said the company decided to port s software to Windows NT before Unix because Winows NT offers a better price/performance ratio.

As with the OS/2 version, the Windows NT-based ffering features two main components — a work flow iodeling tool and the software that actually runs the ork flow.

The new software includes a set of open client plication program interfaces (API) to give various ient-based applications access to Windows NTised servers running Action software, Hardikar said.

The Windows NT software also supports Microift's Open Database Connectivity and Messaging PIs for access to a variety of database and electronic ail systems, Hardikar said.

He added that Microsoft is using Action's work w software internally to develop a new system for ocessing incoming product orders.

Bruce Silver, vice president at BIS Strategic Decions, a consulting firm in Norwell, Mass., said ction's decision to commit to Windows NT makes nse even though few people seem to be clamoring r Windows NT servers at this point. Long term, ers seeking to move beyond basic file server systems ll likely find the Windows NT-based product attrace, he said.

See **Action**, *page 43*

Sybase, Microsoft part company – go separate ways with SQL Server

Oracle not crying over breakup; may be ultimate winner of separation.

BY ROB GUTH AND PETER LISKER

San Francisco

As expected, Sybase, Inc. and Microsoft Corp. last week confirmed the dramatic dissolution of their seven-year technology-sharing agreement for SQL Server.

The two companies formalized their separation when they announced that Sybase would create a Windows NT implementation of SQL Server 10, while Microsoft will continue to enhance the SQL Server 4.2 version for Windows NT that the two companies have sold.

"You have to look at a company like Microsoft as a friend as long as it makes sense for both businesses," said Bob Epstein, executive vice president of Sybase in Emeryville, Calif. "I never look at it permanently, I always look in terms of, 'Alright, for the next phase, is there a way where both companies have an area where working together is beneficial?"

The news was not taken lightly by industry observers.

MAKING THEM NERVOUS

"It makes me very nervous for Sybase and Microsoft to not be sharing code for a standardized version of SQL Server," said Gary Marcus, president of the Oakland, Calif.-based consulting firm Marcus and Partners. "There's really no way I can make a coherent judgment as to which company to ally my company with, given the uncertainty of the products."

While Sybase and Microsoft traditionally were allied to fight the common enemy, namely Oracle Corp., the impending separation of the firms leads some to question their ability to prosper in the database arena independently.

AND THE WINNER IS...

"I think the ultimate winner from Sybase and Microsoft parting ways will be Oracle," said Richard Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago. "The effect of this is going to be that SQL Server customers will end up wondering which company to go with, and Oracle will probably pick up a lot of sales due to indecision at management levels."

"SQL Server customers will end up wondering which company to go with, and Oracle will probably pick up a lot of sales."

Yet Sybase and Microsoft sought to put a positive spin on the announcement and reassure customers they will ultimately benefit.

The existing Microsoft-Sybase relationship has been beneficial for Sybase, Epstein said. "The problem we always faced is that if we focused on the higher end, mission-critical business, the workgroup and departmental [markets] would end up going to other companies," he said. "By leveraging Microsoft, and SQL Server for NT, Sybase's architecture has made a mark on the lower end markets." But, he added, "[Our relationship needed] to evolve. We're ready to take the next step, but in a synergistic way."

Part of that next step, Epstein predicted, is "for both companies helping NT make it into the marketplace." To start, Sybase has made "major investments" this year in ramping up its product line for Windows NT, Microsoft's answer to Unix as a server and client operating system, he said. As markets evolve to demand Sybase products on Windows NT, the firm will be able to supply them, he said.

Epstein said Sybase is developing a System 10 version of SQL Server for NT that is in the beta stage and will be generally available in the third quarter.

Although he thinks Unix will handle most mission-critical applications for now, Epstein has faith in Windows NT.

"If someone wants deployment of an application with a PC-based server, that's historically been either [IBM] OS/2 or [Novell, Inc.] NetWare as the operating system, I think there are some clear advantages to NT," he said.

The decision to develop a Windows NT line is part of Sybase's larger strategy to cover more price points. Before its seven-year itch, it did not have the resources to cover both ends of the database spectrum.

➻Guth is the Tokyo correspondent for IDG News Service.

BRIEFS

Apertus Technologies, Inc. of Eden Prairie, Minn., last week released **middleware** to connect client desktop machines with legacy systems by way of SQL databases.

The company's Enterprise/Access converts legacy data into a form usable by SQL database servers, like Sybase, Inc.'s SQL Server. End users can develop applications that access legacy data via stored procedures on the database server without worrying about the intricacies of mainframe communications, the firm said.

The middleware is available for Hewlett-Pacakrd Co.'s HP 9000 Sun Microsystems, Inc.'s SPARCstations and Pyramid Technology Corp. servers, and supports multiple communications protocols. Pricing ranges from $22,000 to $240,000, depending on Unix server.

Apertus: (800) 328-3998.

J & T Associates, Inc. of Saline, Mich., recently announced an administration package for Lotus Development Corp.'s **Notes groupware** application.

The company's j&t Shell provides BASIC-like tools to develop programs to track the performance and operation of Notes-based applications. The software, available in both OS/2 and Windows versions, starts at $1,200 per license.

J & T: (313) 429-8360.

FlexiWare Corp. of Shelton, Conn., announced last week that it has added support for Sybase, Inc.'s SQL Server 10 database functions to its FlexiFinancials software.

FlexiFinancial's **general ledger and accounts payable** modules run on Windows clients and on Windows NT, OS/2 and Unix servers across a variety of networking protocols. Prices start at $50,000.

FlexiWare: (203) 925-3044.

Xerox Corp.'s XSoft division, of Palo Alto, Calif., last week announced a **document management** indexing system for Novell, Inc. NetWare networks.

Visual Recall is a Windows client that allows users to perform sophisticated searches of documents stored on Novell file servers. The software also allows users to manage and track document revisions.

Shipping is expected in June, with prices starting at $395.

XSoft: (800) 428-2995.

NOTIS Systems, Inc. of Evanston, Ill., last week announced plans to add a sophisticated **Internet** search tool to its WinGopher client.

NOTIS, a subsidiary of Ameritech, will ship by July a new version that supports full searches of Z39.50 databases on the Internet.

WinGopher runs on Windows platforms and provides a graphical interface to the Internet via Gopher servers. Prices start at $129.

NOTIS: (708) 866-0150.

The whole is always great
Incidentally, in networki

As confusing as it sounds, there truly are two completely opposing ways to look at high-performance networking. One is the big picture, the sum total of your network. Because it's only by viewing your network in its entirety that you can be sure it's carrying your organization toward the future without compromising the investments you're making today. Conversely, you can't afford to overlook the smallest detail either. After all, unless it responds and even anticipates the needs of the individuals using it, a network has failed to live up to its potential.

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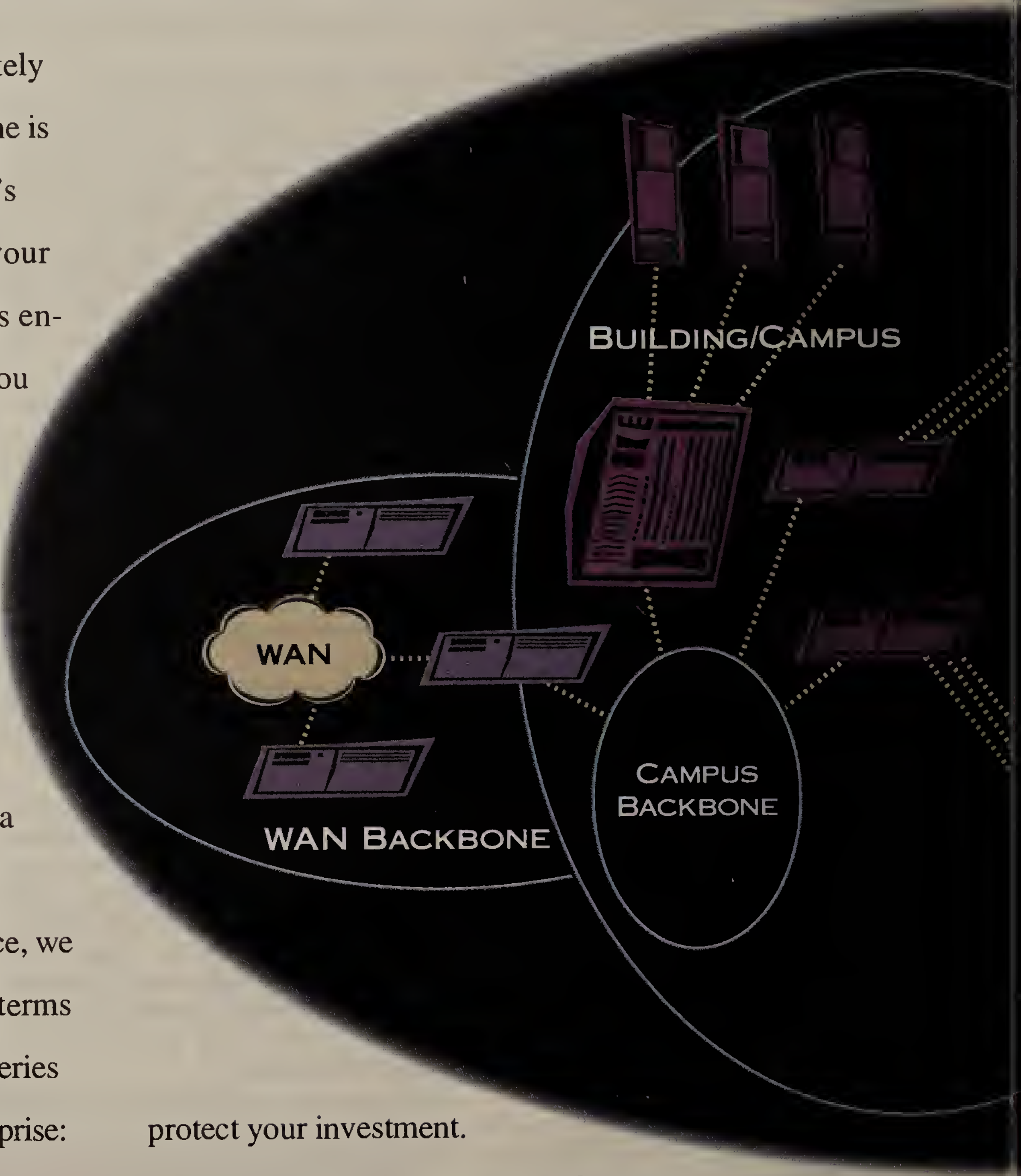

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Expanding the network then becomes as easy as segmenting the backbone, which means you can solve a bandwidth problem in stages and grow the performance incrementally. Stackable and chassis hubs serve to expand and increase the level of segmentation delivered to users. Traffic is still routed

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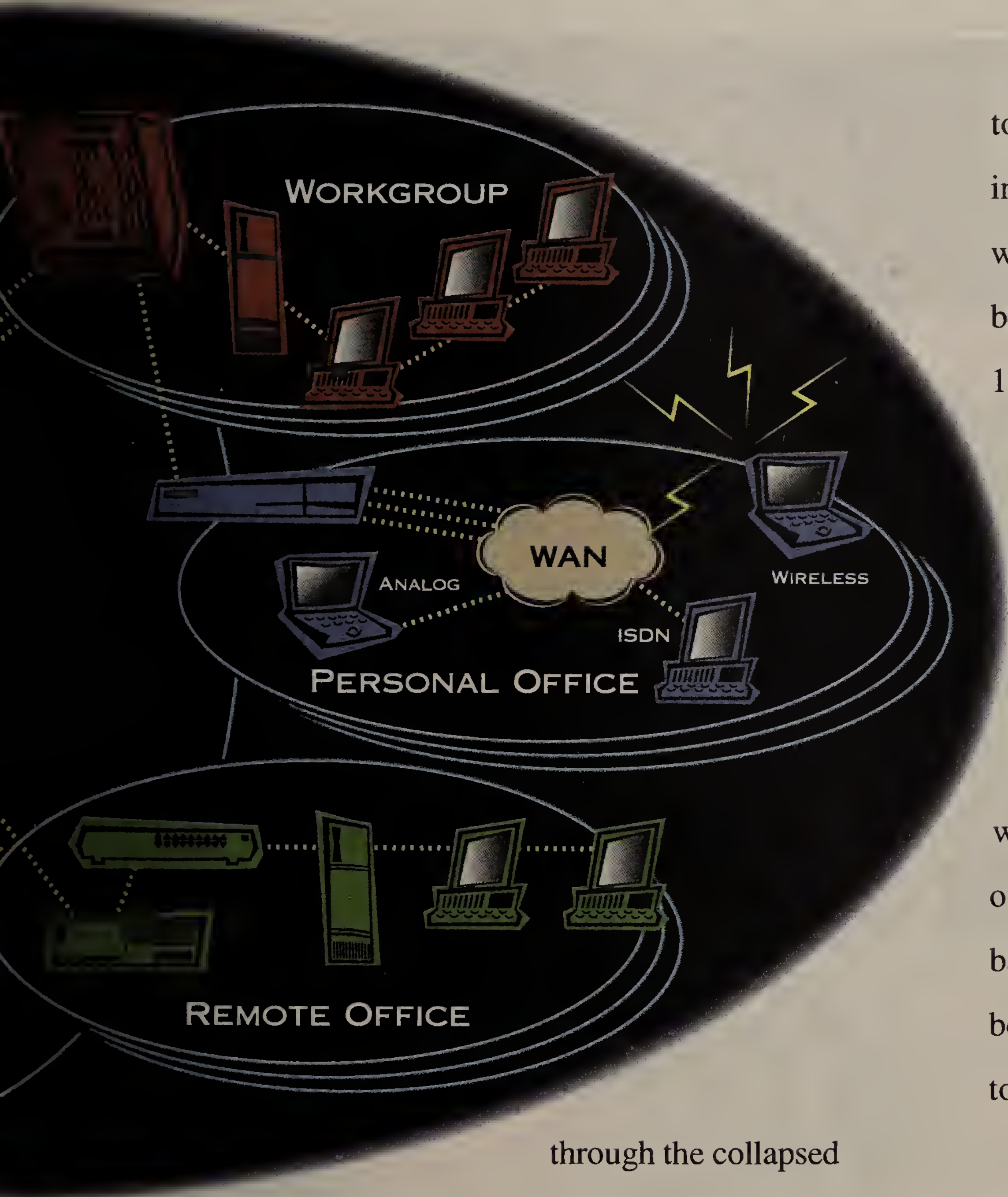
er than the sum of its parts.
ng the reverse is also true.



through the collapsed backbone. And all complexity is centralized, where administrative costs are substantially lower.

As your company's growth continues, and more bandwidth is called for, servers with existing Ethernet interfaces can be connected directly to switching hubs. Mission-critical resources, such as servers, can be attached to FDDI concentrators for greater throughput.

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IMAGE INTEGRATION

Wang opens up document management application

BY KEVIN FOGARTY

Lowell, Mass.

Wang Laboratories, Inc. has released an open version of its integrated image and document management software that will run on multiple client and server platforms, as well as interact with various electronic mail systems.

Open/profound, the newest version of Wang's document management software, is a client/server product that lets users create documents comprising several file types, including text, images and spreadsheets. Users can create, store and retrieve documents, which reside on the server and available to attached client computers.

Previously only available on DOS clients and Novell, Inc. NetWare and Banyan Systems, Inc. VINES servers, Open/profound can now run on Windows clients, Hewlett-Packard Co. HP-UX and IBM AIX servers (see graphic).

Profound platforms, connectivity

Wang's Open/profound software will run on these client and server platforms:

Server operating system
- HP-UX
- AIX
- NetWare 2.2, 3.1 or higher
- VINES 4.11 or higher

Server hardware
- Wang RISC
- IBM RS/6000
- HP 9000

Client operating system
- Windows
- DOS

Client hardware
- Intel 80386 or higher PCs

Open/profound will work with these E-mail systems:
- cc:Mail
- DaVinci eMail
- Microsoft Mail

The product is "another brick in the wall Wang is trying to build" around document management, imaging, work flow and object management, said Bruce Silver, vice president of the Norwell, Mass., consulting firm BIS Strategic Decisions, Inc. Wang has been an innovator in these areas for years, he added.

Judged on form and features, Open/profound is about equal to competitors PC Docs, Inc. in Tallahasee, Fla., and WordPerfect Corp. subsidiary Softsolutions, Inc., Silver said. But where Open/profound stands out is in the tight integration between its document management technology and the imaging capabilities of Open/image, the Wang imaging application built into Open/profound, he added.

Open/profound's document and image integration technology is more robust than the Microsoft Corp. Object Linking and Embedding (OLE) technology used by many vendors to image-enable documents, according to Silver. In other document management applications, when a user selects the image in a document, OLE launches — usually from the server — the software needed to view or manipulate the image. Integrating the imaging software directly with the document management application is a much more robust way of linking images with text because no other software or linking agent is involved.

According to one company that has used the old and new versions of Wang's document management software, the new product is much easier to use than the awkward DOS version. Ted Johnson, a partner in the Wilmington, Del., law firm Morris, Nichols, Arsht and Tunnell, said the old version "was nowhere near as flexible as what we needed."

Adding and annotating documents to existing files was difficult, and the DOS front end made most operations tedious, according to Johnson. "The utility of the [Windows version] finally exceeded the aggravation I got from the [DOS] program," he added.

Particularly useful is the tight integration between Open/profound and WordPerfect Corp.'s WordPerfect for Windows, Johnson said. As users create text documents in WordPerfect for Windows, Open/profound opens windows in the document and requires users to enter filing and indexing information, such as case numbers and dates. New documents are automatically filed at the server and made available by Open/profound without users having to manually import and index them.

Open/image supports most scanners and many image files, can import facsimile documents electronically, includes optical character recognition capability and lets users attach text to images or spreadsheet documents.

The personal computer-based server software costs $795 per server, while the Unix-based server software costs $2,495 per server. The client software is priced at $295 per user.

©Wang: (800) 225-0654.

KnowledgeWare answers Powersoft client/server tool

ObjectView Desktop gives users new low-cost option.

BY KEVIN FOGARTY

Atlanta

The introduction last week of a low-cost, value-added version of KnowledgeWare, Inc.'s ObjectView was the second shot fired in a price war that may mean application development tools are becoming commodities.

By mid-April, KnowledgeWare will release ObjectView Desktop, a scaled-down version of its ObjectView Enterprise development tool that will feature a desktop version of Gupta Corp.'s SQLBase relational database. The low-end version will have an introductory price of $199 and a regular price of $499, compared to the $3,200 cost of the enterprise offering.

DESKTOP DUELING

The new product is an answer to competitor Powersoft Corp.'s recent release of PowerBuilder Desktop. That software has an introductory price of $249 and a list price of $499.

ObjectView Desktop gives developers an object-based graphical tool to help them create applications that run entirely on a client but query server-based databases or other resources. Including an SQL database with a development tool means developers can test new applications by downloading sample data from the server once, rather than tying up the net by running the tests live, according to Matt Miller, Gupta's director of product marketing.

"These tools let you do client/server development on a stand-alone [machine] without tying up the network or on a portable [computer] while you're on the road," said Tim Harmon, program director for application development strategy at market research firm META Group, Inc. in Burlingame, Calif.

UPPING THE ANTE

Although there is still some differentiation among features in first-generation client/server tools, the products are becoming commodities that compete mainly on price, Harmon added. Powersoft fired the first shot, "and KnowledgeWare has answered it, and upped the ante," he said.

ObjectView Desktop includes drivers for desktop databases, as well as server databases from Oracle Corp., Sybase, Inc. and others. The tool can be used to provide pathways between clients and server-based databases via middleware products and supports Microsoft Corp.'s Open Database Connectivity specification.

The desktop ObjectView does not include the version control and communications support that ObjectView Enterprise has to help coordinate developer teams. It also lacks application program interfaces to link with C and C++ languages, as well as other development tools. Upgrades to the enterprise version cost $2,800.

The enterprise version lets teams of developers share objects and information but does not supply the net communications necessary to let users develop server-based applications, said Todd Levi, information and imaging manager for RaceTrac Petroleum, Inc. here.

"I'm glad [KnowledgeWare] came out with a lite version," Levi said of ObjectView Desktop. "It lets people view what the system can do at an inexpensive price."

©KnowledgeWare: (404) 231-8575.

Action

Continued from page 39

Action's work flow software is based on an architecture that consists of a four-step negotiation process (see graphic, page 39). It is based on the way people really work and gives them more flexibility than other work flow systems, according to Hardikar.

Joe Mislinski, vice president of Chameleon Systems Group at systems integrator GTE Vantage Solutions, said using Action's software requires really buying into the company's philosophy. But the software offers such a powerful set of work flow tools that it is well worth the effort, said Mislinski, whose company built Microsoft's Action software-based order management system.

Silver said Action's four-stage work flow philosophy is more suited to a collaborative work flow model than a production environment, in which workers have little choice about which forms or documents to process.

The ActionWorkflow Manager, which runs the work flow, starts at $800 per seat for both OS/2 and Windows NT versions. The ActionWorkflow Builder, which is used to develop applications, has a list price of $1,495 per license.

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Editorial

After some five years of development and a reported $1 billion cost, IBM is proudly displaying its heralded parallel processing mainframes. IBM calls the System/390 Parallel Sysplex a server and wants you to think of it as such because in this world gone client/server mad, mainframe is a bad word and server is a good one. But semantics aside, how do these machines stack up as servers in the increasingly open world of collaborative computing?

Not very well, actually.

On the positive side, they offer tremendous power. Harnessing dozens of new-generation microprocessors, the Parallel Sysplexes boast impressive number-crunching stats in a lower priced, smaller box. And users shouldn't find it too difficult to port applications from existing mainframes. But these boxes have some shortcomings when compared to the competition — increasingly powerful multiprocessing servers based on standard Intel processors running Unix or a network operating system like NetWare.

Despite all the painful lessons learned in the last five years, IBM has built what are essentially closed systems. The microprocessors are IBM-proprietary, and the machines still run MVS, albeit a new and improved MVS that may support Unix applications in the future. Users will still need mainframe-class overhead software such as CICS and VTAM.

Even with software pricing changes promised by IBM, all of that adds up to greater expense and complexity, and higher cost of ownership. What's more, it's not as though you can pop these machines right onto your LANs. IBM has talked about technology that will let users hook the Parallel Sysplex systems directly to FDDI, token-ring and Ethernet LANs, but for now users will still have to futz with the complexities of SNA.

Another concern is the complexity of developing applications for the machines. Development will still be slower and more costly than in an open systems environment, and that isn't likely to change because the innovative development tools coming out today aren't targeted to host developers.

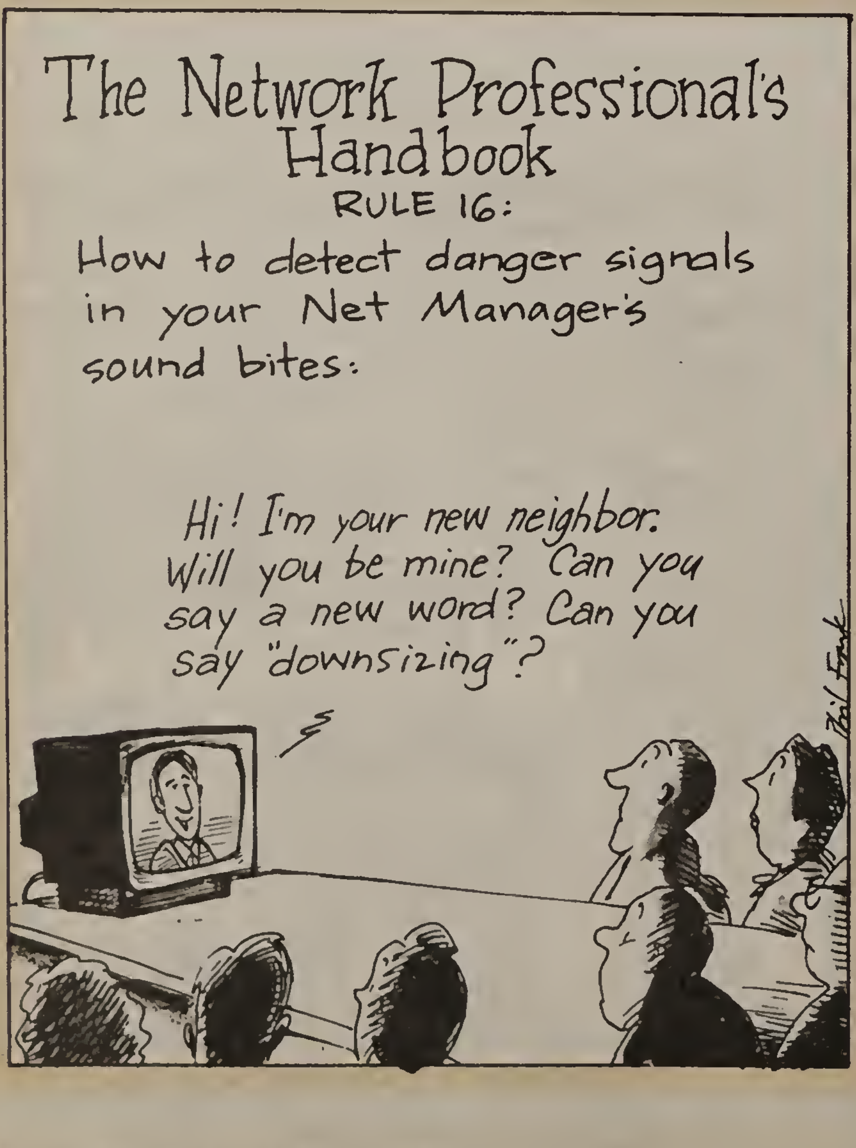
IBM wants to revitalize the mainframe, stemming the huge losses in that sector, by repositioning its large systems as the most powerful server on the network. But for all its time and money, the company seems to have fallen far short of that goal because of the architectural decisions it has made. IBM has always espoused an evolutionary migration for customers, but this is one instance where some revolutionary thinking was needed.

But what do you think? Do these new servers have a role in your network?

JOHN GALLANT jgallant@world.std.com

TELETOONS

FRANK AND TROISE


The Network Professional's Handbook
RULE 16:
How to detect danger signals in your Net Manager's sound bites:
Hi! I'm your new neighbor. Will you be mine? Can you say a new word? Can you say "downsizing"?

NETWORK CONVERGENCE

by Mary Johnston Turner

Deal redefines public net's role in user enterprises

The recent joint announcement that AT&T and Lotus Development Corp. will place Notes servers on AT&T's public network (*NW,* March 21, page 8) signals the dawn of a new generation of interenterprise communications and a significant extension of the scope of the public network.

Network managers need to factor this new option into their planning, particularly if their computing and communications needs call for electronic collaboration with other companies or between large and small offices within the enterprise. This new approach to network-based services is likely to provide a more rapid, secure and scalable alternative than doing it yourself.

Network Notes, as the new offering is called, is the first in what AT&T plans as a series of services to support the emerging $3 billion electronic collaboration industry.

Electronic collaboration is the use of networked computing to facilitate work among remote workgroup members. For example, using electronic collaboration, physicians at different hospitals might be able to simultaneously review test results stored in a Notes database on the server. Each can store their own comments in the database as well.

In a sales organization, a product database could make product specification and delivery status information available to both the customer and the sales agents, including agents who are traveling and need to connect using laptops equipped with dial-up capabilities. The view of the data in terms of which data fields are used and the organization of the information can be customized for each participant in the service.

Many corporations have used private corporate nets to support remote workgroups in the company for some time. Lotus' Notes has been hailed as one of the first successful groupware products to enhance information flow among distributed workers.

Up to now, however, interenterprise deployment of groupware applications has been difficult, often presenting almost insurmountable security and interoperability problems. Even extending the private network to small offices within the same enterprise raises questions over the ability to provide reliable service that is affordable to a small office where a full-time systems administrator is not economically feasible.

The Network Notes service is designed to mitigate security, interoperability and extendibility concerns while helping organizations and cross-enterprise workgroups get up and running quickly. In so doing, AT&T is also redefining the scope and reach of the public network, and setting the stage for the public network to play a greater role in interenterprise communications in the future.

With the placement of Notes servers on the public network, the network becomes not only a conduit linking private computing resources, but an integral part of the distributed computing fabric. AT&T's goal is to provide a platform and a "friendly" environment on which users can place their own applications, whether they be medical test data or product sales information management systems. This means that users (as well as their subcontracted application developers and value-added resellers) will be working more closely with the innards of the public network than ever before. AT&T will provide database administration and platform maintenance services but wants to stay out of the application business.

The service will be accessible via several options, including a dial-up basis using modems and the Internet. For larger locations, access to Network Notes will be supported using AT&T's AccuWAN or Frame Relay Extended Connectivity Option. Both of these call for customer premises equipment such as routers to be owned and operated by AT&T even though they reside on the customer premises.

Taken together, Network Notes and these types of extended network access arrangements move the public network physically beyond the traditional demarcation and into the fabric of the premises network — logically above the transport and internet protocols to the servers and systems that support end-user computing. In network architecture designs, the ubiquitous network cloud historically drawn to represent the public network will now overlap with private nets and extend logically onto customers' systems architecture.

This is a very important set of extensions. Clearly, users are not going to be forced to purchase all network and Notes server elements from AT&T. They can continue to put systems up on their own, just as many do today. However, for organizations interested in collaborating with small offices and other organizations, or who want to reduce their up-front capital investments and ongoing maintenance responsibilities, this new extension of the public network will be an important option. Over time, more and more customer premises equipment and servers are likely to be provisioned and administered under this type of a plan.

For users, this announcement offers a new option for extending their organization's electronic community. Making decisions about how to deploy new applications and how to best achieve interoperability goals is now more complicated with the addition of this newest option from AT&T. Expect to see other network operators such as MCI Communications Corp. and the regional Bell holding companies adding similar distributed computing capabilities as well, eventually moving beyond Notes and electronic mail type servers to public servers supporting virtual conference rooms and interactive multimedia groupware.

The fusion of computing platforms with the network also raises a whole new set of issues to discuss with your vendor. How are service levels and guarantees to be structured, and what is the vendor's liability? How is security guaranteed? Who is responsible for what aspects of applications and system design, development and deployment, and how will all this be coordinated across multiple enterprises?

The AT&T-Lotus announcement is an important step in the development of the commercial Information Superhighway. Stay tuned for continued reshaping of the public network in the coming years, as it takes on more of the characteristics of a computing internetwork.

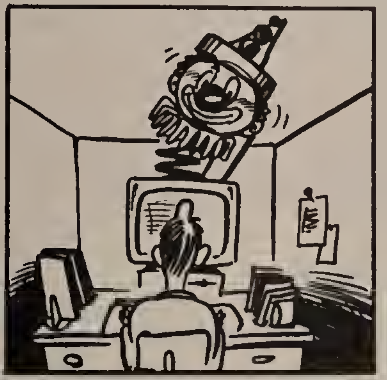
Turner is a principal with Northeast Consulting Resources, Inc., a Boston-based consulting company. She can be reached at (617) 654-0619 or via the Internet at turner@ncri.com.

THE INFORMATION SUPERHIGHWAY

by Ben Rothke

Changing medium won't change masses

Hardly a week goes by without Vice President Gore giving a pitch for the National Information Infrastructure (NII) (March 7, page 4). Gore envisions a nationwide Information Superhighway, where brilliant ideas and intellectual information will flow like water, linking citizens far and wide. And if Gore really believes this hype, perhaps, unlike his boss, he *did* inhale.



What Mr. Gore does not seem to realize is that an NII is already in place. Print, broadcast and telecommunications media have served as an NII for many years. Most Americans read some type of newspaper or periodical; nearly every American household has a telephone, television or radio. The only difference is that Mr. Gore wants to take the informational domain of the physical (newspapers, periodicals and books) and near-physical (radio and TV), and transpose it to pure electronic cyberspace.

But simply changing the medium will not make any qualitative difference in the content of the message. Sending U.S. users into the cyberspace of the new NII will not change their drives and desires.

Mr. Gore somehow perceives that giving all Americans Transmission Control Protocol/Internet Protocol software, a service provider and an NII address will somehow elevate them from the mundaneness of life and motivate them to seek higher, more intellectual pleasures. Mr. Gore has been deluded into thinking that changing the medium will change the masses.

Some key players in the precyberspace NII 1994 are: *TV Guide, National Enquirer, Cosmopolitan, Car & Driver* and *Computer Shopper.* Now, if we change the medium from paper to fiber-optic cable, where do you surmise the hot spots on the NII will be?

According to a study published in April 1991 by the Network Measurement Project at the Digital Equipment Corp. Western Research Laboratory in Palo Alto, Calif., the top three newsgroups on the Internet were: alt.sex, rec.humor.funny and misc.jobs.offered. I am not implying that all Internet users are spending their working hours discussing deviant lifestyles, telling jokes and following the Grateful Dead, but the study seems to prove the point that transforming the medium will not transmute the individual.

If the academicians of the Internet are busy with alt.sex, what can we expect when mainstream America gets hold of its Internet connection? One need only look at the traffic on the Internet and see how much space and time is squandered on relative nonissues, and how little real work is achieved. Simply transporting people into cyberspace will not make them thinkers. The hype about the Internet is growing more quickly than the net itself.

The Internet, which is the prototype of the NII, has been the secret domain of the TCP/IP community, academia, military and others for more than a decade. It is only with the advent of the White House's commitment to developing a national Information Superhighway that the Internet has made it to prime time television and *Newsweek*.

The reason many people love the Internet is that it is a lot of fun. Where else can people from far and wide exchange ideas about nearly anything? Sending E-mail at near light speed and getting an even quicker response is what has made for myriad Internet zealots.

But for those of us who are not employed by think tanks or are in academia, perhaps our time may be better spent doing productive things, rather than participating in some obtuse Internet user group conference. Nothing can be done to change the nature of the entity, for the traffic on the Internet is only a reflection of the sender. One must simply start taking a pragmatic view of the NII and what it is realistically capable of, and skip all the grandiose notions.

➔ Rothke is network computing manager at Track Data Corp., a New York-based supplier of financial market data. He can be reached via the Internet at ber@tdc.com or on CompuServe at 74710,3325.

Letters

Telecommuting can work

As a proponent of telecommuting (and good management), I take issue with some of the comments Don Farrar made in his letter to the editor (March 21, page 35).

Mr. Farrar claims that the manager of an employee working at home has very little ability to monitor or control the amount of work being done.

He believes that workers "need a 'cattle prod' to function at a high level all the time. The prod is the boss being able to come in unexpectedly, just to see how things are progressing."

First, Mr. Farrar needs to check into some management seminars, for his view of management is the worst there is — it is demoralizing and stressful for the employee. Being given greater levels of responsibility and accountability, along with proper amounts of positive motivation and criticism, improves productivity.

Hovering over employees and conducting surprise interrogations on them just makes them want to find a way to avoid additional work and responsibility — and the boss.

Second, it is mostly the middle management jobs which are drying up across corporate America, not the line jobs that Mr. Farrar describes.

Regarding prompt access to coworkers and "computer geniuses" — we use the telephone. Off-premise extensions or second residential telephone lines are commonplace when setting up the facilities for a work-at-home employee.

In the very near future, multimedia workstations will only enhance the effectiveness of the home office worker.

I have to agree with Mr. Farrar's perspective that telecommuting isn't for everyone. It probably never will solve the traffic, air pollution and other problems that some folks think it will.

Telecommuting is a work philosophy that should be applied carefully and specifically to appropriate situations, and can be highly motivating for the employee.

Kevin Tisdall
Information technology analyst — networks
Chrysler Capital Corp.
Stamford, Conn.

The bottom line

I was troubled, to say the least, by Don Farrar's letter regarding telecommuting. Any employee who is able to spend his or her days hanging out and occasionally pressing the enter key, and still meet deadlines, obviously does not have enough work to do.

If this is the case, the person is most likely slacking off in the office as well. The measure of a person's work should be based on the results produced, not the number of hours spent looking busy.

Of all the functions of a boss, being a cattle prod is by far the most negative I have ever heard. In this day and age, one would like to think that people can be motivated to work by something more positive than fear.

Managers have a more important function in an organization than to check up on employees to ensure they are working.

Is the workplace of the 90s going to be a high-tech version of a 19th century sweatshop or can we apply a new way of thinking as well as new technology? The bottom line is that all employees should be doing work, which is important to the success of the company. Employees must take pride in a job well done, whether they are at home or in the office.

Andre Baskin
Software engineer
Integrated Device Technology, Inc.
Santa Clara, Calif.

Benchmarks needed

Don Farrar apparently subscribes to the Neanderthal school of management that measures work by the amount of activity rather than results.

Whether your employees are telecommuters or office-based, the only effective way to manage is through measurable benchmarks.

If the deliverable is a report, you know whether or not it was delivered. You read it to assess its content. A telecommuter puts it on a file server so the manager can access it.

Why does it matter how hard, or when, the guy worked to produce it? If the deliverable is a working piece

See Letters, *page* 61

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Directory differences drive NOS decision

Banyan, Novell lead the way with global directories, while Microsoft and IBM play catch-up.

BY TONY CROES AND JOSH PENROD

Every now and then what appears to be a complex decision turns out to be a lot more straightforward because it ultimately hinges on only a key factor or two. Take selection of an enterprise-level network operating system (NOS), for example.

Any buyer sizing up the market may be geared up to wade through a myriad of decision points, but times have changed. NOS selection today hinges heavily on a single criterion — that of enterprise-level directory services.

Directory services bring the hundreds of servers and thousands of users across an enterprise under common administrative control putting an end to the days of managing each server separately. With directory services, users and resources are defined once and all servers share access to the directory.

Without an enterprise directory, each server in the network must be managed individually. Users requiring resources on a server must have an account on that server. This means end users are often defined on several servers across the enterprise and they often must know which servers have the resources they need to access. If a user's access rights change, then the user's account on each server must be updated.

Four vendors today offer enterprise-level NOSes: Banyan Systems, Inc., IBM, Microsoft Corp. and Novell, Inc. Banyan has offered enterprise-level directory services in VINES from its earliest days, while Novell recently added enterprise directory services in its NetWare 4 product last year. IBM's OS/2 LAN Server 3.01 and Microsoft's Windows NT Advanced Server (NTAS) provide similar but more limited domain services.

While directory services is the overriding factor to consider in NOS selection today, there are a few other important issues that will play a role in the buying decision. Chief among these issues is how well the NOS was architected to take advantage of the advanced processing capabilities of the server platform, its native internetworking capabilities and its support for a diversity of clients. Fault tolerance is also important, something users have understood for sometime (see story, page 50).

And there is an emerging hot issue in NOS evaluation. Vendors are integrating key services, such as messaging, directly into the NOS, as opposed to running them as specialized applications (see story, page 54).

ARCHITECTURAL ISSUES

The key to understanding a NOS is to look at how it was architected. Each of the enterprise NOSes take advantage of 32-bit operating systems, as well as multitasking and multithreaded capabilities. Yet there are some subtle differences. Both NetWare and VINES are designed as true NOSes that orchestrate the operation of a server's CPU and memory.

NetWare is Novell's own creation. It was originally designed to perform file, print and basic directory functions for client workstations in a single-server environment. But NetWare quickly expanded to become an application processing platform. For instance, third parties can write applications — dubbed NetWare Loadable Modules (NLM) — that use NetWare's services.

Because NetWare implements unique memory management features to speed processing tasks, some developers have found that their NLM-based applications outperform their equivalent Unix-, OS/2- and Windows NT-based offerings.

VINES is really Banyan's own version of Unix System V. VINES was designed from the start to provide enterprise-level network services, including file, print, wide-area network communications and directory services. VINES, too, can run applications developed to work within its environment. Although tools that ease development of VINES-based applications exist, applications deployed in NetWare are far more prevalent.

Windows NTAS and LAN Server are simply applications that run on top of a general-purpose operating system. Windows NTAS runs on Windows NT, while LAN Server runs on OS/2. Those underlying operating systems provide access to computing power, memory and communications, while Windows NTAS and LAN Server provide network services.

In Windows NTAS and LAN Server, developers use tools for Windows NT and OS/2 to build networked applications. It is better to run those applications — such as Lotus Development Corp.'s Notes for OS/2 and Microsoft's SQL Server for Windows NT — on separate OS/2 and Windows NT server platforms rather than on the same server as Windows NTAS and LAN Server. This prevents a rogue application from disrupting the network services on which both the applications and users depend.

Each of the NOS vendors is developing a strategy for permitting new applications to become services available on the network, regardless for which platform they are developed or the location of the servers.

Novell's AppWare foundation, for example, is a set of tools that allows developers to build applications for a variety of clients. These clients use back-end services, such as messaging, database, backup, communications and others, that are plugged into NetWare. AppWare clients on OS/2, DOS, Windows, Macintosh and Unix platforms access these services without having to know the intricacies of each underlying platform, operating system or the system calls used on servers.

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NETWORK WORLD SHORT LIST 1994

Network operating systems

✓ **Banyan Systems, Inc.**
VINES 5.525

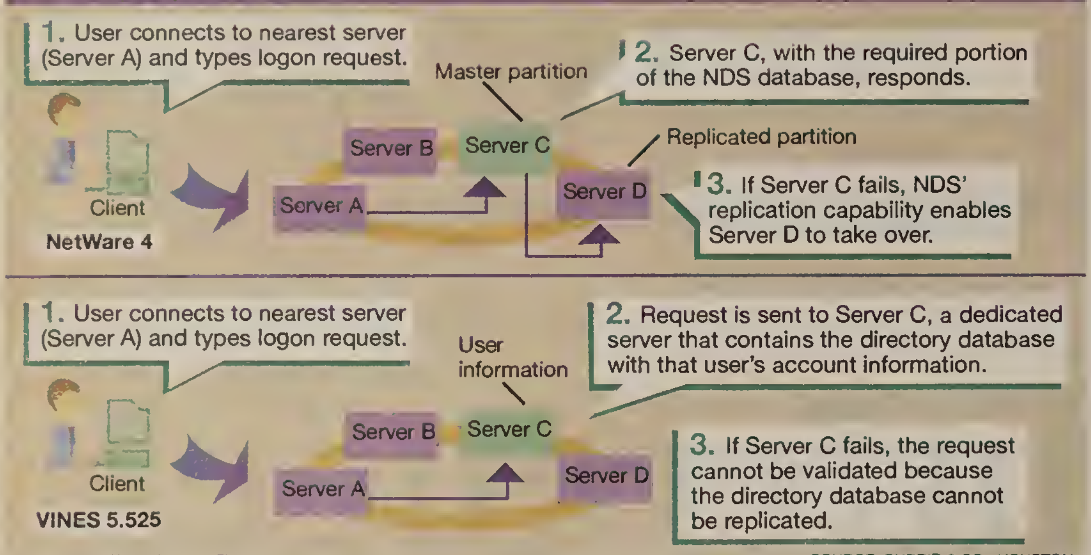
✓ **Novell, Inc.**
NetWare 4

Complete details about The Short List appear on page 52.

inside

- NOS shops stake out positions on fault tolerance. Page 50.
- Rivals play catch-up with Banyan over messaging services. Page 54.
- Security and management features take top billing in survey of reader needs for NOS products. Page 54.
- Not all NOSes stack up well on enterprise services. See Buyer's Guide chart, page 52.

Logging on to NetWare 4 and VINES 5.525



NetWare 4:

1. User connects to nearest server (Server A) and types logon request.
2. Server C, with the required portion of the NDS database, responds.
3. If Server C fails, NDS' replication capability enables Server D to take over.

VINES 5.525:

1. User connects to nearest server (Server A) and types logon request.
2. Request is sent to Server C, a dedicated server that contains the directory database with that user's account information.
3. If Server C fails, the request cannot be validated because the directory database cannot be replicated.

GRAPHIC BY TERRI MITCHELL

SOURCE: CURRID & CO., HOUSTON

Continued from page 49

Each NOS also exploits the advanced capabilities of server platforms. Both VINES and Windows NTAS support symmetric multiprocessing, while NetWare and LAN Server currently do not. However, Novell has announced a two-phase strategy for providing multiprocessing capability in NetWare, and IBM has announced a symmetric multiprocessor version of OS/2 2.1 that should extend this capability to LAN Server.

In symmetric multiprocessing, all the CPUs on a server share a common memory area. The operating system then determines how the CPUs access that memory and how tasks are split across the CPUs to speed processing.

In the past, these systems were extremely complicated and expensive. Although this problem has been solved by technological advances, the biggest hurdle to symmetric multiprocessing is still limited scalability. Symmetric multiprocessing systems become complicated when there are more than four processors because they must use very high speed dual- and triple-ported memory with special application-specific integrated circuits to manage memory access.

By contrast, in asymmetric multiprocessing, each CPU has its own memory and is dedicated to running its own individual tasks. These tasks then talk to one another via interprocess communication facilities. In a loosely coupled asymmetric multiprocessing environment, computing power can even extend beyond a single computer.

In the short term, Novell intends to develop symmetric multiprocessing for NetWare in order to take advantage of the new lower cost multiple CPU servers coming to market. Novell's long-term goal is to develop a loosely coupled application architecture that will allow network applications to use computing resources from more than one server. In effect, the network will become the bus for logical servers comprising several physical servers.

MANAGING THE UNMANAGEABLE

The NOS architecture determines how it will run and where services and applications reside. But it is the NOS services that enable users to manage their networks.

Very few networks begin life as well organized and managed internetworks. While it might be quite acceptable to handle networks that have only a few servers and a hundred or more users by performing administration duties on each server, that approach is sheer chaos in much larger networks, as many net managers have found.

As the number of servers and users increases, it becomes exceedingly difficult to perform what should be simple and routine tasks, such as adding new users and giving them access to resources or adding new services to the network. Experience has taught network managers that administration and maintenance of users and services accounts for the majority of network costs. Fortunately, NOS vendors are responding to the plight of network administrators with solutions geared to meet the needs of more complex networks.

For instance, they utilize two types of enterprise naming — directory and domain service — to enable end users to log on to the network using a single logon and password. Once logged on, users can then access resources anywhere, as opposed to having to log on to each server separately.

Directory services provide centralized control of security, users and services. Below these are the domain-oriented schemes, which organize users, security and access to resources into groups of servers that form a domain. Managing users and resources is done at the domain level, and users log on to a domain rather than a server.

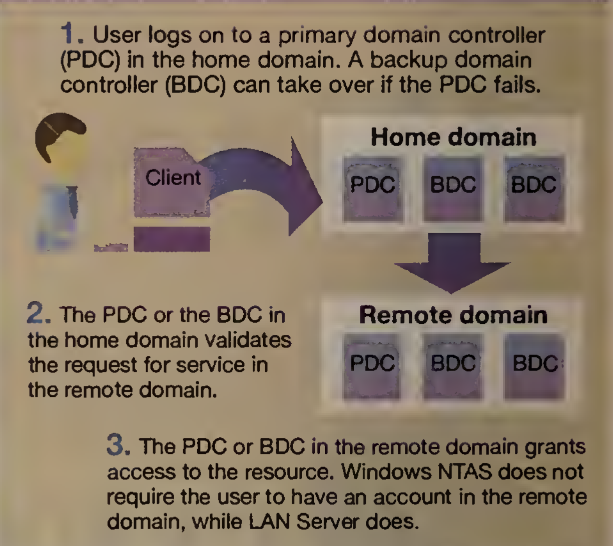
The primary attractiveness of directory services lies in the fact that they present a network-centric, rather than server-centric, point of view. Although the network comprises many servers, directory services obviate the need to manage them independently.

For instance, an account that defines a user name and password, as well as specifies the access rights that user has, is created in the directory only once. When that user requires access to a resource, the directory validates the user's access rights, locates where the resource resides — whether it is local or across the globe — and assists in connecting the user to the resource. Changing the access rights for that user or relocating an application from one server to another is made easy by entering updates to the directory.

From the user's point of view, the network appears as a single service and access to network resources is granted through a single user name and password.

Similarly, the resources of many servers are available to users, regardless of their physical locations. If a service on the network becomes unavailable, the network continues to function and users are still able to log on and use other network resources. The only problem would be that the services on that server would no longer be available.

Crossing domains



1. User logs on to a primary domain controller (PDC) in the home domain. A backup domain controller (BDC) can take over if the PDC fails.
2. The PDC or the BDC in the home domain validates the request for service in the remote domain.
3. The PDC or BDC in the remote domain grants access to the resource. Windows NTAS does not require the user to have an account in the remote domain, while LAN Server does.

GRAPHIC BY TERRI MITCHELL

SOURCE: CURRID & CO., HOUSTON

While domain-level services offer similar features as directory services, there is a limitation. Domains only manage the servers, users and resources within a particular group such as an accounting department. To gain access to servers in other domains, an added layer of administration is required in each domain.

DIRECTORY SERVICES

There are currently two variations of globally implemented directory services: Banyan's StreetTalk III and Novell's NetWare Directory Services (NDS). Banyan has been providing global directory services with VINES all along, and the refinements that have gone into StreetTalk III really show Banyan's strong directory skills.

Meanwhile, Novell introduced NDS with NetWare Version 4 and, like Banyan, is continuing to refine the product. StreetTalk III and NDS are based on the X.500 directory services

Continued on page 52

No-fault insurance for NOSes

With so many strategic applications running on LANs these days, it's crucial to check out a NOS' ability to support fault tolerance.

There are quite a few areas in which a network operating system can and should help prevent network downtime, including: power irregularity control, maintaining redundant data, supporting redundant network interfaces cards for a net segment, mirroring servers, and error checking and correction features.

One of the more common problems that will cause network problems is power irregularities. A simple and effective way to mitigate power problems is to attach an uninterruptible power supply (UPS) to servers. Should an outage hit, NetWare, VINES, Windows NT Advanced Server (NTAS), and LAN Server all can monitor the power level of the UPS as a standard feature of their respective NOSes and determine when it is appropriate to begin an orderly network shutdown.

Hardware failures are another area that should be addressed. Because of the constant use, hard drives can and often are common points of failure. NOS support for Redundant Array of Inexpensive Disks (RAID) technology enables users to recover from a failed disk since all data is basically stored on two disks. The most common types are RAID 1 (disk mirroring and disk duplexing) and RAID 5 (disk striping with parity).

Disk mirroring keeps an exact copy of a disk on a similar disk with both being controlled by the same controller. Disk duplexing is really disk mirroring, except each disk has its own controller. Capabilities available in NetWare 4, LAN Server 3.01 and Windows NTAS can mirror data onto two different disks without the need for additional third-party software, while VINES must rely on third-party software for help.

Disk striping with parity comprises two functions. Data is broken down into small pieces, which are then distributed among all the disks in the array. This provides multiple channels to the data, which improves performance. The parity part relegates a section of each drive in the array for storing data from other disks.

When a disk fails, the redundant information on the other disks is used to rebuild the information. Windows NTAS is the only NOS that supports RAID 5 without the need for third-party or add-on products.

If you happen to use VINES or Windows NTAS, a segment connected to a server through a single network interface card (NIC) would lose access to the network if that NIC failed. LAN Server and NetWare — through Balance 1.11, codeveloped by Novell and Network Specialists, Inc. — can support multiple NICs for the same network segment.

The NIC is effectively removed as a single point of failure, and the multiple NIC configuration allows for load sharing.

For truly mission-critical applications and data, Novell's System Fault Tolerance (SFT) III and IBM's NetDoor are add-on products that let users set up mirrored or replicated servers. SFT III creates a mirrored server that comes on-line and immediately takes over when a primary server fails. A high-speed link between the primary and backup server keeps the data synchronized.

NetDoor works a little differently. Instead of an exact mirror of hardware and software, the servers are synchronized only periodically. NetDoor does, however, allow for load sharing between the replicated servers.

The tracking of database transactions is especially important. If a server crashes while a database is being updated, errors from incomplete record updates can be introduced. Most schemes involve returning the database to the condition it was in before the crash.

NetWare 4, VINES, Windows NTAS and LAN Server all have some sort of tracking and correction abilities. NTAS and LAN Server are more limited though. Windows NTAS' protection only extends to the Windows NTFS file system. LAN Server tends to view this problem as a database function, not a NOS function, requiring an add-on feature.

Novell takes the feature of error detection and correction a little further. Every time information is written to a network disk, NetWare 4 performs a read-after-write verification process to check if the information now on the disk matches the information still in memory. If they do not match, NetWare assumes that area of the disk has gone bad and rewrites the information to special hot-fix areas of the disk.

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Banyan Systems, Inc. (800) 828-2404	VINES 5.525	3, 4	8M/ 256M	80M/ 20G	S	✓ (1)		✓ (1)		✓	✓ (1)	✓ (1)	✓	✓	✓	✓ (1)	✓ (1)	✓ (1)	E	D, M, NT, O, U, W	N	P, S					✓ (2)		C: $2,995/10; $7,995/50; $9,995/100; $14,995/250 S: NA
IBM (800) 342-6672	OS/2 LAN Server 3.01	3, 4, P	9.9M/ 2G	10.4M/ 64G	A				✓	✓	✓	✓			✓ (1)	✓ (1)	✓ (1)	✓ (1)	D	D, M, NT, O, U, W	N, O	C		✓	✓	✓	✓	✓ (1)	C: $75/1 S: $2,245
Microsoft Corp. (800) 426-9400	Windows NT Advanced Server	3, 4, A, M, P, R	12M/ 4G	90M/ 17m T	S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ (1)	✓ (1)	✓ (1)	D	D, M, NT, O, U, W	N, O	P, S	✓	✓		✓ (1)	✓	✓ (1)	C: NA S: $1,495
Novell, Inc. (800) 638-9273	NetWare 4	3, 4, P	8M/ 4G	60M/ 32T	NA	✓		✓		✓	✓	✓		✓ (1)	✓ (1)	✓ (1)	✓ (1)	✓ (1)	E	D, M, O, U (1), W	N, O	P, S (1)		✓	✓	✓ (1)	✓ (1)	✓ (3)	C: $3,195/10; $6,295/50; $8,795/100; $15,695/250 S: NA
	NetWare 3.12	3, 4, P	6M/ 4G	30M/ 32T	NA	✓		✓		✓	✓	✓		✓ (1)	✓ (1)	✓ (1)	✓ (1)	✓ (1)	NA	D, M, O, U (1), W	O	P, S (1)		✓		✓ (1)	✓	✓ (3)	C: $2,495/10; $4,995/50; $6,995/100; $12,495/250 S: NA

Products highlighted by color were selected for The Short List.

FOOTNOTES:

(1) Requires an add-on product.
(2) Optional feature.
(3) Available with NetWare System Fault Tolerant III.

CMIP = Common Management Information Protocol
ESD = Electronic software distribution
ICP/SPP = Interprocess Communication Protocol/Sequenced Packet Protocol
NA = Not applicable
NETBEUI = NETBIOS Extended User Interface
NIC = Network interface card
NDIS = Network Driver Interface Specification
ODI = Open Data-link Interface

Continued from page 50

standard and offer a single view of the network with centralized control of servers, users, security and network resources. However, the two offerings are quite different.

Novell's NDS is more flexible. There are 15 hierarchical levels to the naming structure in NDS, compared to StreetTalk III's three levels.

Levels are like an organizational chart for a corporation. In Novell, the top level is known as the root, which might represent the entire enterprise. Flowing out from the root are organizational units, such as geographic and functional divisions. Each organizational unit can have several naming levels that represent groups of users and resources. At the very lowest level of NDS are individual users and resources such as shared file volumes and printers.

Architecturally, NDS is a distributed and replicated directory database. NDS partitions, which are portions of the database, can exist on multiple servers in the network as read/write and read-only copies. If the server containing the master copy of a partition fails, there would be no affect on users' ability to access network services because a replicated partition can take over.

"With NDS, Novell has provided the dual capabilities of allowing the administrator to organize the network resources in the most effective way and [through partitions and replication], an effective means of providing fault tolerance for the network database in the event of a server or link crash," says Michael Ellerbe, a Certified NetWare Instructor and Enterprise Certified NetWare Engineer with Computer-Technology, Research and Education Center, an educational firm in Houston.

In StreetTalk III, the hierarchy is limited to an organization at the root of the directory tree. There are only two levels below the root, a group and a resource. Furthermore, each server in a VINES network maintains its own portion of the StreetTalk III directory. This means there are separate databases that are manageable through VINES administrative tools and searchable from any node on the network. But there are two drawbacks in this architecture.

First, if a VINES server were to go down, any user that is defined in its StreetTalk III directory would lose access to the network since they could not be validated for logon (see graphic, page 50). Second, the directory information stored on a particular server is globally available, but it must be sent across the network when a directory search is done. In large networks, searches of the StreetTalk III database can take an enormous amount of time because the information is stored on many servers.

Banyan overcomes the limitations of searching StreetTalk III through what are arguably the best directory assistance tools on the market. The network administrator can define a subset of the StreetTalk III information stored on each server that is replicated to a flat-file database on selected servers across the network. StreetTalk Directory Assistance (STDA) tools allow users to search this local database for any of the characteristics that the administrator has specified.

Additionally, the administrator can control how often these databases are updated. While Novell's NDS can also be searched, it cannot be searched for multiple criteria, and its directory assistance tools are not as sophisticated as those provided by STDA.

"Some of Banyan's greatest strengths are often overlooked," says Kenny Manchester, president of Symphony Network Computing Group, a consulting firm in Houston. "Presently, only VINES offers a robust messaging system that is tightly integrated with its directory services."

Adding new resources to StreetTalk III is simply a matter of attaching the new server to the network; StreetTalk III takes care of the rest. The new server advertises itself and becomes part of the directory services. Or if two separate trees are added to the same network, the common naming scheme allows StreetTalk III to automatically combine them into a single network tree without changing each tree's individual structure.

In NetWare, the process is more difficult. Users must create or migrate new servers into an existing directory tree. In the case where one organization absorbs another with its own directory tree, users have two choices. Novell promises to deliver in NetWare 4.1 a tool called DSMERGE.NLM that will combine both directory trees at the root level. The current alternative is to manually migrate the existing servers out of the old tree and into new locations on the existing one, in effect, rebuilding the directory tree from the root out.

So while NDS' flexibility allows it to more closely match the structure of an organization that consists of multiple operating units, the price users pay is complexity. And this price is paid dearly by any user moving from earlier versions of NetWare, such as NetWare 3.12, to NetWare 4 and NDS.

NDS is a totally different concept from the bindery database used in earlier versions of NetWare. The bindery is best geared to sup-

Continued on page 54

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Net mgmt. applications vendors

Network World invites you to participate in a product survey for an upcoming Buyer's Guide on network management applications. If you'd like to receive a survey form, call (800) 622-1108, Ext. 461, and leave a message for Cheri Paquet, assistant editor, or Barbara Wierzbicki, Buyer's Guide editor. Be sure to include your voice and fax numbers when requesting a product survey. Vendors must contact *NW* no later than April 25 to receive a survey form.

NETWORK WORLD
SHORT LIST
1 9 9 4

Net operating systems

In this Short List, Network World *identifies key criteria that best address the enterprise network needs of buyers in search of a network operating system (NOS). Each NOS has its own strengths and weaknesses, but taken as a whole, only two stand apart when compared in terms of application deployment, platform and client support, internetworking capabilities and, most importantly, directory services.*

■ Banyan Systems, Inc.
VINES 5.525

Banyan's directory services, StreetTalk III, is extremely mature, stable and capable, yet it is easy for both administrators and users to understand. VINES eliminates the administrative headaches present in a multilevel directory system such as Novell, Inc.'s NetWare Directory Services (NDS) through effective tools and automatic management of new servers and services. VINES' intelligent treatment of internetworking and messaging over wide-area networks is more mature and stands apart from the competition. VINES provides robust enterprise capabilities without sacrificing simplicity and elegance.

Unfortunately, limited support for the NOS among third-party developers makes VINES a less attractive choice as an application server. VINES' StreetTalk III directory and intelligent internetworking capabilities are what currently place it ahead of Microsoft Corp.'s Windows NT Advanced Server (NTAS). This will remain the case until Microsoft's strategy for the enterprise becomes more clear.

■ Novell, Inc.
NetWare 4

Of the enterprise NOSes, NetWare 4 meets all of the top selection criteria with the greatest overall success. NDS readily adapts to complex organizational structures and its distributed/replicated architecture makes it tolerant of network interruptions. However, NDS lacks effective management tools and is not as refined as Banyan's StreetTalk III in terms of directory administration. On a different plane, the domain-based services of IBM's OS/2 LAN Server 3.01 and Microsoft's NTAS cannot compete with NDS and StreetTalk.

And NetWare 4 offers better deployment of network services over wide-area links. NetWare's support for a variety of clients and its effectiveness as an application platform are what tip the scale in favor of NetWare over VINES.

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- Understand the differences between packet switching and cell switching.
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- Contrast the operation of Frame Relay and X.25 protocols.
- Learn how existing transport technologies such as TCP/IP and Novell's NetWare can be integrated with broadband protocols.
- Understand how SONET and fiber optic transmission will fit into broadband networking.
- See how SNMP will play a key role in broadband network management.
- Be prepared to evaluate the broadband service offerings from the Local Exchange Carriers (LECs) and Inter-Exchange Carriers (IXCs).
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- Obtain the status of the current standards for ATM, Frame Relay and SMDS.

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Continued from page 52

porting workgroups that utilize a single server, which was the original focus of NetWare. Now that workgroups have outgrown single servers, users need a more centralized directory that tracks users and resources across multiple servers, and NDS provides just that.

While tools are available to move information from binderies into NDS, users have to learn a whole new, complicated naming concept. And the current lack of tools for merging separate NDS trees makes it imperative that users structure their NDS tree right the first time or spend a considerable amount of energy reconstructing it once they find out where they went wrong.

DOMAIN SERVICES

Domain services like those provided by Windows NTAS and LAN Server provide many of the same features of directory services but on a more limited scale.

In either LAN Server or Windows NTAS, administrators can group users, servers and resources with a common thread — such as a large department — into a domain. Each domain must have a primary domain controller (PDC), a server that maintains the entire database of users, security and access privileges for that domain. Users log on to the PDC or a backup domain controller (BDC) that provides load sharing or can take over account validation processing if the PDC fails. The PDC or BDC then grants access to services and information across the domain.

While not as sophisticated as StreetTalk III or NDS, domains are still an improvement over workgroup-oriented NOSes such as NetWare 3.12, in which a user must log on to each individual server in order to access resources.

Banyan offers its Enterprise Network Services (ENS) product, which pulls information from the binderies of several servers to form a quasi directory service. ENS is essentially a version of StreetTalk for NetWare 3.12 environments and provides a directory services alternative to users that do not want to move to NetWare 4.

Windows NTAS offers a big improvement over LAN Manager 2.2, Microsoft's former NOS product, through the use of a new service called Interdomain Trust.

Windows NTAS' Interdomain Trust blurs the line between domain-based services and global directory services by providing a single network logon with access to the resources of more than one domain. The PDC in the user's home domain is assigned to validate a request for access to resources, such as a shared file volume, in another domain. The request is sent to the PDC in the next domain, which then trusts that the user has been validated and provides access to the resource.

Windows NTAS' Interdomain Trust merely eliminates the need to replicate the user account in each domain. An administrator must still explicitly assign privileges to resources in the remote domain for each group or user. For instance, while the PDC on the remote domain trusts that requests for resources in its domain have already been validated, it still needs to check with its own security database to make sure that the cross-domain access is permissible. Otherwise, the remote domain will not service the request.

In short, Interdomain Trust still requires some level of administration on multiple domains.

"We depend heavily on an application called Fourth Shift that forces us to run NetWare," says Ron Williams, MIS director at Wilkinson Manufacturing Co. of Fort Calhoun, Neb., a maker of foil and plastic products for the food industry. "Otherwise, we would move over to Windows NT Advanced Server to benefit from its domain-based services. Currently, I see no benefits in terms of money or effort in moving to NetWare 4."

LAN Server is similar to Windows NTAS in terms of its means of Interdomain access. If a user needs access to resources in another domain, the person does not have to log on to each domain. However, the user account must still be replicated in each domain, and access rights to the resource must be assigned within each domain. For instance, in LAN Server, the PDC in the user's home domain validates a request for access to a resource in a remote

Continued on page 58

Closer ties between E-mail, NOS

Vendors of enterprise NOSes are moving to better integrate messaging with directory and domain NOS services.

Messaging services provide a means of addressing, storing and sending messaging data in many forms: electronic mail, facsimiles, group scheduling, work flow, form flow, electronic data interchange and others. These systems are typically client/server-oriented with a full-featured message transport service residing on the back end and many types and brands of front-end applications, including E-mail, fax and groupware.

The key to these types of services is the fact that they will eventually be tightly integrated with directory services. This will alleviate the classic problem of managing fax, E-mail and groupware activities across different locations.

Currently, only Banyan Systems, Inc. has a highly capable messaging engine that is tightly integrated with its network operating system directory services. By comparison, the other NOS vendors are playing catch-up.

Banyan has been providing integrated messaging for a number of years. The company's Intelligent Messaging (IM) system is already tightly integrated with VINES' StreetTalk III directory services, making addressing as simple as identifying users, groups or organizations — there is no need to do anything else. IM automatically chooses the most economical path for messages, has fault recovery, message encryption and message compression when shipped across a wide-area link.

Banyan's back-end service supports a wide variety of front ends, including Lotus Development Corp.'s Vendor Independent Messaging (VIM), Microsoft Corp.'s Messaging Application Programming Interface, and the up-and-coming Common Message Format. Banyan also recently acquired Beyond, Inc., creator of the popular rules-based E-mail client, BeyondMail.

Novell, Inc. has a relatively strong position in the market place with its NetWare Global MHS (NGM). The Message Handling Service (MHS) standard has been around for sometime, and more than 150 vendors offer MHS-compatible products. NGM provides enterprise-level services, such as hierarchical management domains, extended addressing and automatic directory synchronization, which were not present in standard MHS. Just as in NetWare Directory Service, Global MHS user accounts are created and managed through a hierarchical domain-based system and are visible throughout the enterprise.

During its recent BrainShare developers' meetings, Novell said it intends to include NGM in future releases of NetWare 4. The separate NGM product will remain to support the NetWare 3.X community. Although NGM is closely integrated with NetWare 3.1X binderies, managing users and directory synchronization is a server-based burden. Creating new users, adding privileges and setting up routes occurs on a server-by-server basis. Upgrades to NetWare 4 will eliminate this problem, as messaging will be highly integrated with directory services, and users will be part of the directory tree.

Microsoft's Enterprise Messaging Server (EMS) is expected during the latter part of this year. Its offering will provide more robust routing services than those found in Microsoft Mail and additional Lotus Notes-type features such as discussion databases and bulletin boards. EMS is an add-on server product that runs on Windows NT and initially will not be part of Windows NT Advanced Server (NTAS). But EMS is eventually expected to integrate with Microsoft's forthcoming X.500-based directory services, codeveloped with Siemens AG. And yes, Microsoft is developing directory services, too.

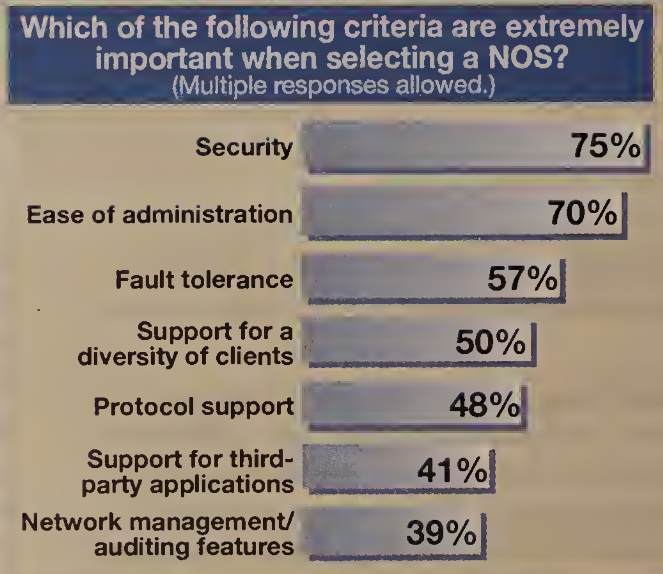
Consider, though, that EMS will be offered as an application for Windows NT and will not initially run on Windows NTAS. That means users must run EMS as another application server on top of a general-purpose operating system.

Compare that to Novell's NGM, which runs as a NetWare Loadable Module on a NetWare server alongside other file and print services, negating the need for dedicated application servers.

T. Croes

Reader views on network operating systems

Based on 100 interviews.



Which of the following criteria are extremely important when selecting a NOS?

(Multiple responses allowed.)

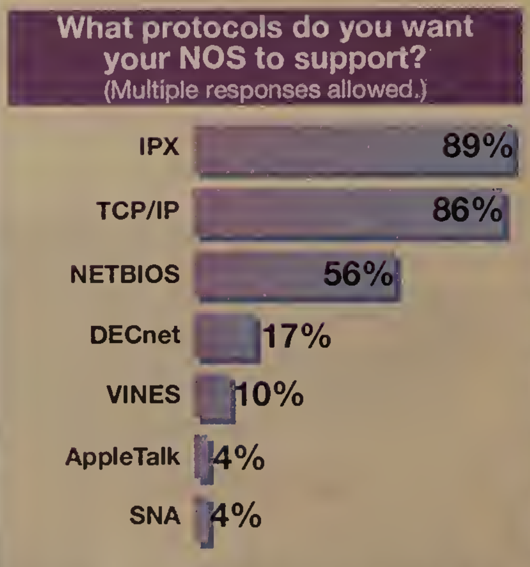
What client environments are/will be on your network?

(Multiple responses allowed.)

DOS	92%
Windows	92%
Unix	52%
OS/2	50%
Macintosh	42%
Other	4%

Where do you prefer that your applications/services run?

Application/service	As part of NOS	On application server	Both	Don't know	Total responses
Database	43	36	10	2	91
E-mail	58	21	7	2	88
Remote access	28	38	9	9	84
Fax	22	29	5	11	67
Document management	27	18	3	4	52
Imaging	20	23	2	3	48
Multimedia	19	18	3	2	42



What protocols do you want your NOS to support?

(Multiple responses allowed.)

Key service and support issues

Based on highest possible score of 3.

Ease of installation	1.64
Bulletin board access to patches, advice, etc.	1.27
On-line documentation	.98
Toll-free hot line	.91
On-site service as part of warranty	.80
Optional on-site service contracts	.32
Other	.11

The information in this graphic illustrates key findings of a recent *Network World*/Focus Data, Inc. reader survey on NOSes. Focus Data, an independent market research firm in Framingham, Mass., conducted the survey and tabulated the results. For more information about Focus Data services, call (508) 626-2556.

GRAPHIC BY SUSAN SLATER

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Continued from page 54

domain. The PDC in that remote domain will know the user has been validated, but it will check its own database to make sure that user has been granted access to the resource (see graphic, page 50).

INTERNETWORK SUPPORT

Just as applications and services have a heavy dependency on the platforms they run on and the directory or domain services they use, they also depend on particular protocols to carry these services to other parts of the network. When NOSes use nonroutable protocols, it is impractical to deploy applications on internetworks that are local and nearly impossible to deploy them on WANs.

The two most commonly used routable protocols are Novell's Internetwork Packet Exchange (IPX) and the Transmission Control Protocol/Internet Protocol. As long as an enterprise network's routers and NOSes can handle these or similar routable protocols natively, then users can interconnect their LANs. If a NOS uses a nonroutable protocol, such as the Network Basic I/O System or NETBIOS Extended User Interface (NETBEUI) natively, then users will have to implement a workaround, such as encapsulation to tunnel the nonroutable packets to where they need to go.

Of the NOS contenders, NetWare and VINES support routable protocols natively. NetWare uses IPX/Sequenced Packet Exchange (SPX), while VINES runs a derivative of TCP/IP called Interprocess Communications Protocol/Sequenced Packet Protocol (ICP/SPP), or simply VINES IP.

Windows NTAS and LAN Server do not natively support routable protocols. Windows NTAS uses NETBEUI, and LAN Server implements NETBIOS. However, since routability is a strategic necessity, Microsoft's answer in Windows NTAS is to provide the capability to encapsulate NETBEUI in either IPX or TCP/IP, while IBM encapsulates NETBIOS in TCP/IP.

While each NOS contender offers support for a mix of network protocols in their various client software, there is no guarantee that the client will be able to access any type of server. For instance, even though they support TCP/IP, neither Windows NTAS, LAN Server or VINES supports TCP/IP-based Unix clients. This is because Windows NTAS and LAN Server use higher level protocols, such as NETBIOS and NETBEUI, to provide their services over the local network, while VINES uses VINES IP to provide access to its services.

Novell has a similar situation with its NetWare Core Protocol (NCP), which it uses to deliver NetWare services to clients. But Novell provides NCP client software for virtually every desktop operating system. And although other NOSes and server operating systems, such as Windows NT and Unix, support IPX as a network transport, they cannot access NetWare services without support for NCP.

An excellent example occurs in a network that has workstations running client software provided by Microsoft and Novell. Microsoft provides native IPX support in its NetWare Link (NWLink) and NetWare NETBIOS Link (NWNBLink) client software for Windows NT and Windows for Workgroups clients. Both NWLink and NWNBLink work with Microsoft's Network Driver Interface Specification for network interface cards (NIC).

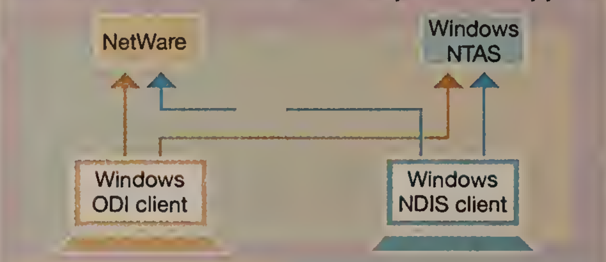
NWLink utilizes IPX as a native transport mechanism to enable Windows NT and Windows for Workgroup clients to reach Windows NTAS servers over an IPX router network. NWNBLink wraps NETBIOS packets in IPX to enable clients to reach Windows NTAS servers. However, because NWLink and NWNBLink do not support NCP, they cannot provide access to NetWare servers.

On the other hand, Novell's requester software utilizes the Open Data-link Interface NIC driver and NCP to enable Windows for Workgroups and Windows NT clients to access NetWare resources.

With NETBIOS support, the requester software can provide clients with access to Windows NTAS servers, as well (see graphic, this page).

Partial support

How vendors can limit their multiprotocol support.



Novell's ODI NIC driver enables IPX-based client software to use NCP to access NetWare services or NETBIOS to access Windows NTAS services.

Microsoft's NDIS supports IPX, but only for routing NETBIOS packets to Windows NTAS services. Its lack of NCP support prevents it from being used to access NetWare services.

GRAPHIC BY TERRI MITCHELL

SOURCE: CURRID & CO., HOUSTON

The closer net managers look at the protocol support offered by these vendors, the more it begins to read like a romance novel — who is sleeping with whom, and who's jealous?

LOOKING AHEAD

As internets continue to grow, the need for the type of network-centric view that directory services offers will also increase. And vendors will continue working to improve their current offerings. For instance, Microsoft is working with Siemens AG to provide X.500-based directory services in future products.

IBM will also have to abandon domains or be left behind, but it has yet to give a clear indication of its directory services strategy.

Banyan was first on the scene and arguably ahead of its time in delivering an enterprise-level NOS. The refinements and growing pains that VINES has been through should make it a very attractive alternative. NetWare 4 has made a good start with NDS, but it lacks effective management tools. Novell is trying to move quickly to rectify this situation with NetWare 4.1, which is scheduled for delivery later this year.

Currently, none of the contenders can deliver directory services that can pull all resources — even those supported by a mix of NOSes — under a single umbrella. But vendors of enterprise NOSes are plainly moving in the right direction as they fill out their directory services strategies.

➜ Croes and Penrod are industry analysts at Currid & Co., a consultancy in Houston. Croes can be reached via the Internet at tcroes@radiomail.net and Penrod can be reached via CompuServe at 75250,1267.

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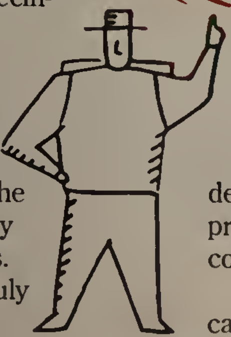

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Help desk

Continued from page 2

Diagram,'' shows the combined disaster recovery planning activities described in preceding chapters. This chart orients readers with the complex and multifaceted processes that go into a corporate disaster recovery program.

Hayes also recommends The *Handbook of Effective Disaster/Recovery Planning* by Alvin Arnell (McGraw-Hill, Inc.), a compilation of all Arnell's disaster recovery seminars and workshops given in the last five years.

Some of the sections in the book include: ''Vulnerability Analysis and Recovery Requirements Definitions;'' ''Recovery Strategy Selection and Risk Management;'' ''Recovery Management Plan and Procedures Development;'' ''Implementation and Testing;'' and ''Ongoing Administration and Plan Maintenance.''

These books represent just about everything you need to know to successfully implement an effective disaster recovery program.

Several weeks ago, we informed readers about Electrotext, a Help utility for Novell, Inc.'s NetWare 3.12 and 4.01.

Several readers have since inquired about how to obtain Electrotext via File Transfer Protocol (FTP) from the Internet and whether it is available on CompuServe.

Ronald Nutter, director of technical services at 900 Support, a 24-hour, seven-day-per-week NetWare technical support company in Lake Oswego, Ore., replies:

Electrotext for 3.12 and 4.01 is available via FTP on the Internet by typing ftp.novell.com. The file is called NW312D8.ZIP and is located in the \pub\epub\netware\3.12 directory.

When you FTP to ftp.novell.com, specify the logon name as ''anonymous,'' and use your complete E-mail address as your password. Sometimes, FTP connections are refused due to an overload on the system.

Electrotext is not available on CompuServe because of the file's size — 10M bytes.

Letters

Continued from page 47

of software functionality, you can demonstrate it regardless of where the work was performed.

Bill Buffam
Network consultant
Unisys Corp.
Malvern, Pa.

Measure expectations against results

Managing an employee requires little more than establishing specific expectations and measuring results agreed to by the employee and the supervisor.

To assume an employee needs a cattle prod to function at a high level makes me question Mr. Farrar's understanding of the manager's basic role in any successful business today.

Many organizations, including manufacturing organizations, development laboratories, and yes, federal agencies, have found that telecommuting provides a high-impact alternative to achieve worker productivity, product reliability and customer satisfaction. I do not suggest that telecommuting fits every firm and employee situation. I do suggest, however, that telecommuting will play an ever-increasing role in how we do business in the future.

Karl Damanda
Senior consultant
Network Services Group
Woodbridge, Va.

Don't forget Fischer

Some additional information for your readers regarding David Marshak's LAN-based E-mail buyer's guide (Feb. 28, page 35):

In discussing the benefits of client/server, Marshak stated that only two products currently supported the client/server model. He neglected to include Fischer International Systems Corp.'s EMC^2/TAO messaging product in that list.

Fischer International first used the client/server concept for E-mail in 1982 when it introduced EMC^2/TAO in the IBM mainframe environment.

EMC^2/TAO is now the only E-mail/office automation product that seamlessly supports all of IBM's mainframe operating systems and the AS/400, and LAN environments — including Novell, Inc.'s NetWare, Microsoft Corp.'s LAN Manager, IBM's LAN Server, Digital Equipment Corp.'s Pathworks and Banyan Systems, Inc.'s VINES.

Carol Smykowski
Public relations
Fischer International
Naples, Fla.

'Finger' of fate

Regarding Adam Gaffin's article ''Use caution when 'Finger' does the walking'' (March 21, page 62):

The command Mr. Gaffin is describing, which lets an Internet user see who is logged on to an Internet host at a given time, is WHO, or W in Berkeley Software Division Version 4.3 — not Finger. Perhaps what he meant was the user uses Finger to look up the results of WHO.

J.J. Stewart
Supervisor, electronic systems division
Philadelphia Naval Shipyard
Philadelphia

Gaffin's reply: Finger can generate a simple list of people logged on to an Internet host when used in this form: finger@site.name (assuming that the site allows Finger requests).

Buyer's Guide query

Have you published a Buyer's Guide section lately on network interface cards (NIC) or hubs?

If so, I would like to know how to obtain a reprint. If not, are you going to do one in the future?

Dave Hoyt
Manager of information technology
El Paso County Community College
El Paso, Texas

Editor's reply: A Buyer's Guide to 100M bit/sec adapters (NICs) appeared in our March 21 issue, page 41.

We published a Buyer's Guide to intelligent wiring hubs in our March 8, 1993, issue, page 49, and will be updating it in our May 2 issue.

A Buyer's Guide to Asynchronous Transfer Mode products, including adapters, hubs and switches, will appear in our Sept. 19 issue. To order reprints, contact Reprint Services at (612) 582-3800.

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Nothing interrupts **Fernando Flores'** *work flow*

Profile

BY PAULA JACOBS

Political imprisonment may not be considered a step-up on the career ladder. But then again, network innovator and former Chilean government official Fernando Flores has never missed an opportunity to further himself.

In fact, Flores kept on studying communications theory while he was detained in Chile for three years following a military coup that overthrew President Salvador Allende in 1973. At the time of the coup, Flores was 30, Chile's minister of economics and finance, and interested in applying technology to facilitate communications among workers.

The research he conducted in detainment helped him formulate work flow concepts that were eventually embodied in software developed at Action Technologies, Inc., a company he cofounded with Stanford University computer scientist Terry Winograd after his emigration to the U.S. Those products include The Coordinator, a workgroup scheduling tool now licensed to DaVinci Systems Corp., the Message Handling System (MHS), which was sold to Novell, Inc., and the Action Workflow System, a suite of client/server applications targeted at organizations that are reengineering their business processes.

Today, Flores is chairman of the board of Business Design Associates, Inc., an Emeryville, Calif.-based business process consulting company he founded.

Flores came to this country in 1976 after the San Francisco chapter of Amnesty International, Stanford University and then-U.S. Secretary of State George Schultz arranged for his release from prison. Because Flores was already an internationally recognized scholar, a research position in the Department of Computer Science and Communications at Stanford University awaited him.

It was while at Stanford that Flores teamed with Winograd and used artificial intelligence to refine the work flow concepts he began formulating in Chile.

"Fernando Flores is by far one of the brightest people I know, and he thinks in creative ways that other people haven't thought about yet," Winograd says.

Flores and Winograd coauthored *Understanding Computers and Cognition,* which later served as the basis for development of work flow software at Action Technologies. That book followed publication of *Communication and Management in the Office of the Future* in which Flores wrote about his work in language, communications, management and computer science.

As part of his research, Flores found that the foundation for all work hinges on peoples' ability to negotiate and integrate their activities with each other.

THE VISION THING

"My vision is that people will realize that connecting people from different places will always require coordination," Flores says. And networks can be used to ease that coordination burden.

"Management and communications are interlinked," Flores says. "When people talk about communications, they think about sending messages. But based on our research, we have found that work flow is a process. We are now able to use the information [uncovered in our research] to perform work flow analysis for companies."

Friends and family confirm that Flores is very driven in making sure that his vision becomes a reality. "He really cares about making things happen," Winograd says. "That's what sets him off from other smart people with a vision."

Flores' eldest son Rodrigo describes his father as a true entrepreneur who will dedicate years of effort to make an idea a reality. "He invents possibilities for other people and is not a lone wolf inventor, but convinces other people to join him in the vision and make it happen," says Rodrigo, vice president of product marketing at Action Technologies. "This ability requires tremendous leadership, bringing it all together by getting others to communicate."

Rodrigo vividly recalls a talk he had with his father in 1977, when, as a 14-year-old, he was interested in rock concerts and other teenage activities. During the father-son talk, dad predicted that one day communications among personal computers would be a principal way to coordinate the completion of tasks.

"He was so intent, and I was supposed to get something out of this father-son talk," Rodrigo says. "It was a defining moment. I was 14-years-old, and we were talking about coordination. That was when he set out to build The Coordinator, and now I'm marketing work flow software."

The entire Flores family remains closely involved in Fernando's vision. His other son Pablo also works at Action Technologies while his wife, Gloria, and daughters Gloria and Maria Fernandez work at Business Design Associates.

Flores' vision includes his view that customer satisfaction, not completion of a job, is the objective of every business process. According to Flores, customer satisfaction cannot be achieved until customers acknowledge that each of their criteria has been met. This concept has been applied to the Action Workflow System, which identifies the basic processes of every business transaction, and defines workers' roles and their commitment to complete a job in the drive to deliver customer satisfaction.

Flores believes that technological and business problems are intertwined; every business professional, including technical network managers, must be concerned about customer satisfaction. For example, in a distributed networking environment, the customer may be someone who requires a certain level of network service. In this environment, the goal of the network manager may be to produce more satisfied customers by improving coordination, which yields greater productivity.

"It is important to understand that communications means the sending of information," Flores says. "However, the real problem is receiving the assurance that communications did in effect happen at the point where it produced customer satisfaction."

INFLUENCES

Flores says professors he met at The University of California at Berkeley, Stanford and Catholic University in Santiago, Chile were important influences on the development of his vision. Yet, he credits his close-knit family as the driving force behind his success. While he was in prison, his wife, whom he married at age 19, supported the family in Chile. Later, the family needed to readjust to the return of a long-absent father and husband, plus a new life in the U.S.

Flores inherited this keen sense of family from his parents. His mother played a key role in shaping his thinking about business and entrepreneurship. Flores' mother was 23 when she established a business selling brooms out of her home in Talca, a small town south of Santiago. She soon expanded this business and later owned a lumber company. With his mother as a role model, he learned how to overcome personal circumstances to achieve one's goals.

Future plans include working at Business Design Associates and greater involvement with social issues, such as helping Hispanic young people both in the U.S. and Mexico, where he also has family and offices. As for his major accomplishment, he emphatically states, "My contribution is a new way to think about business and deal with the complexities of the computer age."

Title: Chairman, Business Design Associates, a consulting firm in Emeryville, Calif.

Chief innovation: Formulated work flow techniques that are implemented in several software products, including Novell's MHS.

Professional history:
- Founder of Business Design Associates and Action Technologies
- Researcher at Stanford University's Department of Computer Science and Communications
- High-level government official in Chile under Salvador Allende

Education: Degree in industrial engineering from Catholic University in Santiago, Chile. Doctorate in computer science from the University of California at Berkeley.

Jacobs is a Framingham, Mass.-based consultant and writer specializing in networking and emerging technologies. She can be reached via the Internet at pjacobs@world.std.com.

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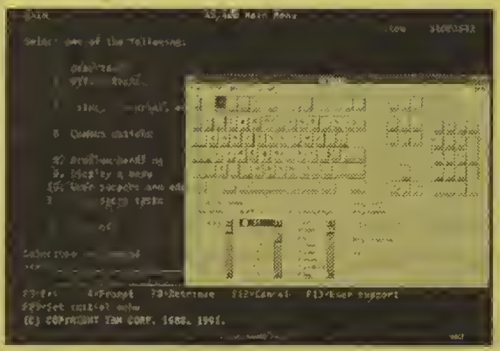

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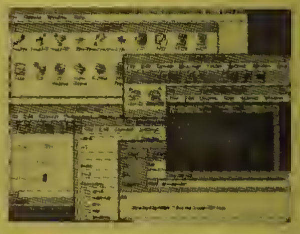

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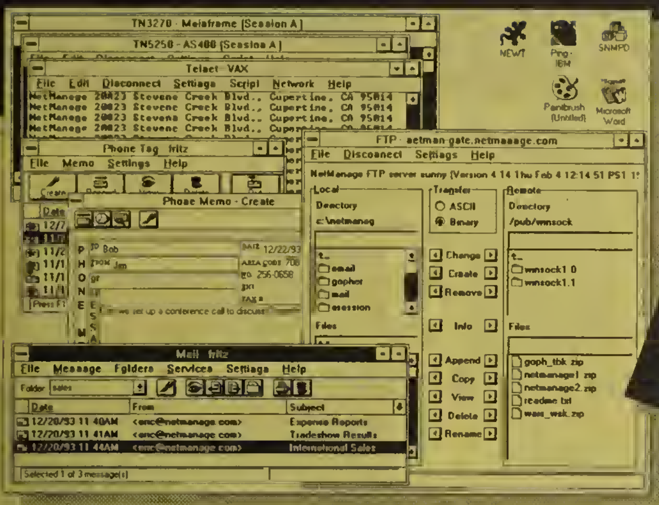

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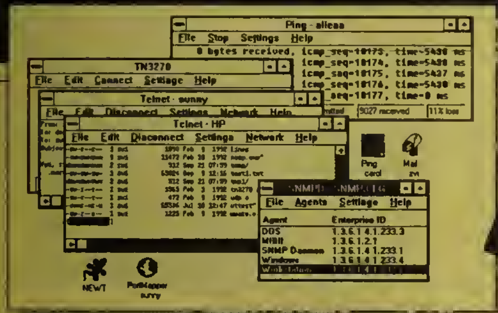

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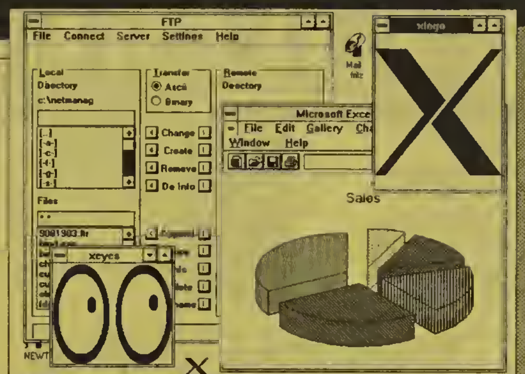

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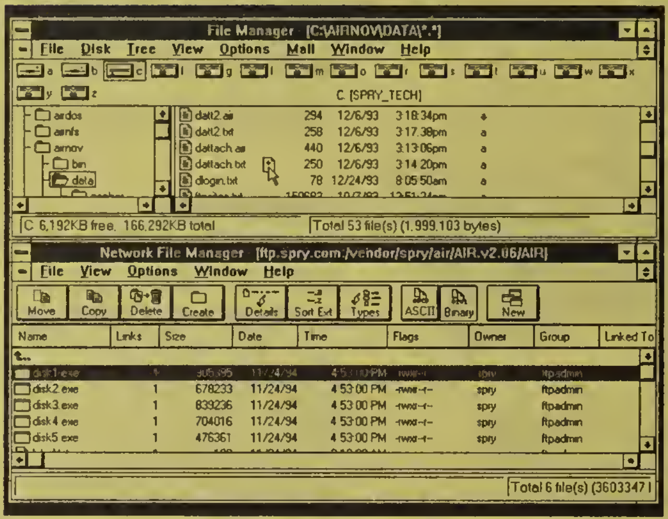

```
File Manager - [C:\AIRNOV\DATA\*.*]
File  Disk  Tree  View  Options  Mail  Window  Help
C: [SPRY_TECH]
ardos        datt2.air      294  12/6/93   3:18:34pm  a
airnfs       datt2.txt      258  12/6/93   3:17:38pm  a
airnov       dattach.air    440  12/6/93   3:13:06pm  a
  bin        dattach.txt    250  12/6/93   3:14:20pm  a
  data       dlogin.txt      78  12/24/93  8:05:50am  a
C: 6,192KB free, 166,292KB total    Total 53 file(s) (1,999,103 bytes)

Network File Manager - [ftp.spry.com:/vendor/spry/air/AIR.v2.06/AIR]
File  View  Options  Window  Help
Move  Copy  Delete  Create  Details  Sort Ext  Types  ASCII  Binary  New
Name       Links  Size    Date      Time        Flags       Owner  Group    Linked To
disk1.exe  1      905395  11/24/94  4:53:00 PM  -rwxr--r--  spry   ftpadmin
disk2.exe  1      678233  11/24/94  4:53:00 PM  -rwxr--r--  spry   ftpadmin
disk3.exe  1      839236  11/24/94  4:53:00 PM  -rwxr--r--  spry   ftpadmin
disk4.exe  1      704016  11/24/94  4:53:00 PM  -rwxr--r--  spry   ftpadmin
disk5.exe  1      476361  11/24/94  4:53:00 PM  -rwxr--r--  spry   ftpadmin
                                                 Total 6 file(s) (3603347
```

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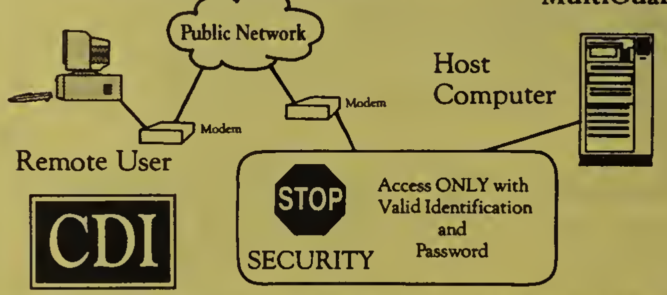

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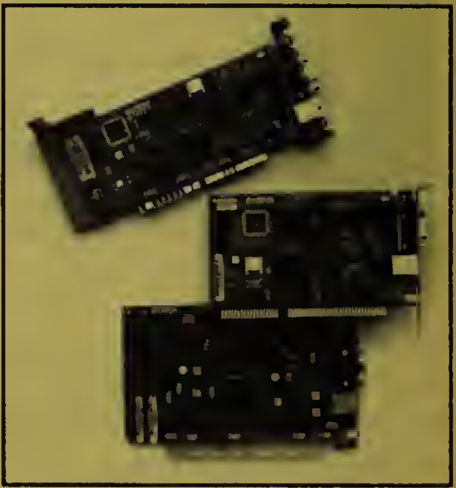

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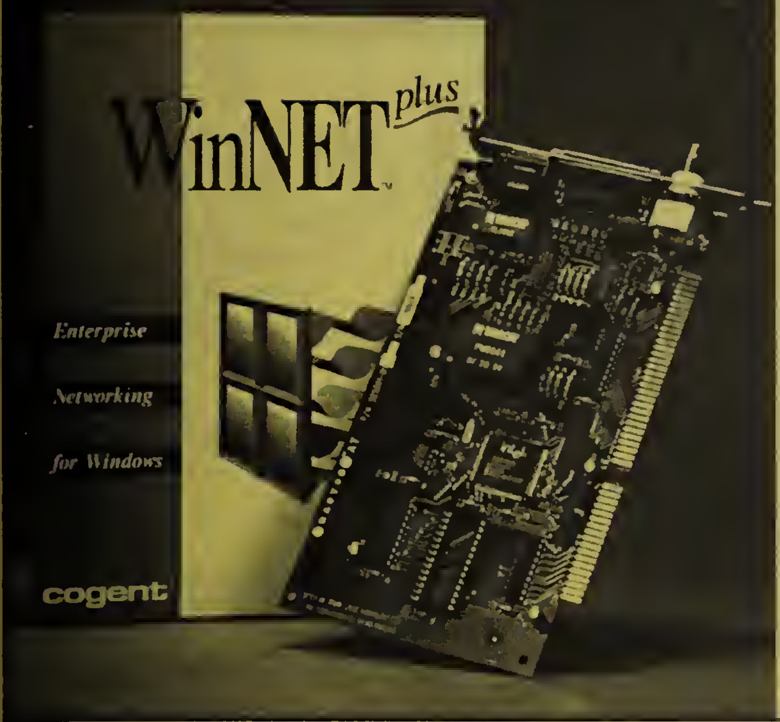

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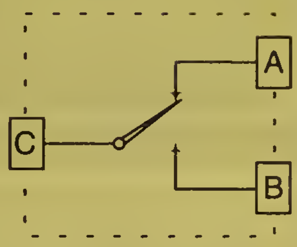

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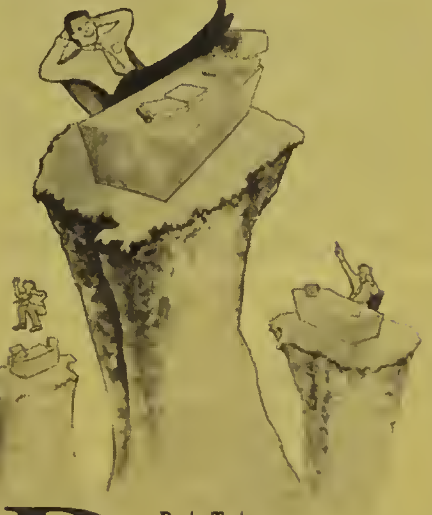

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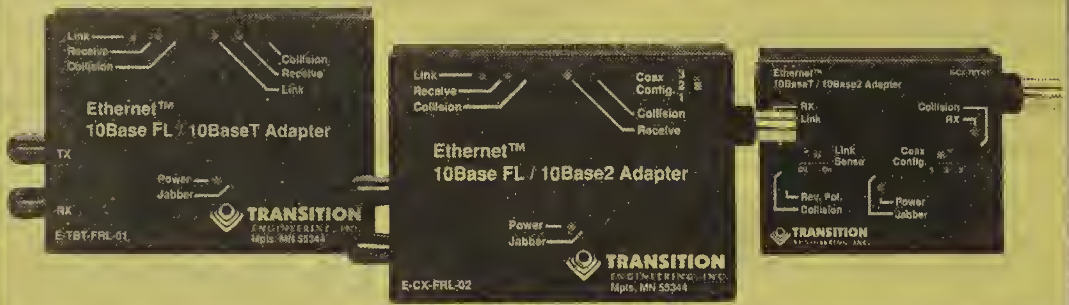

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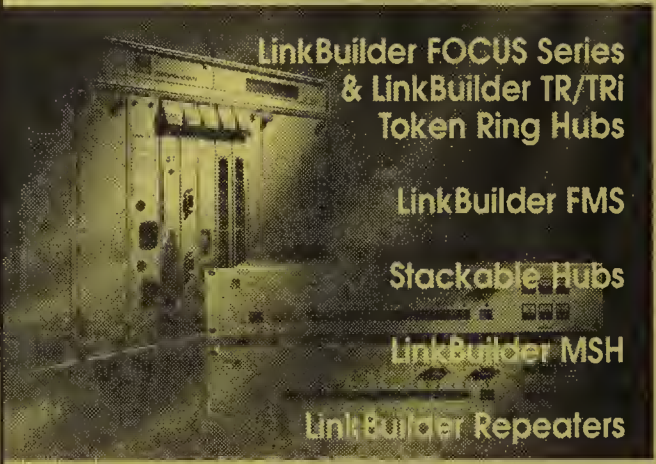

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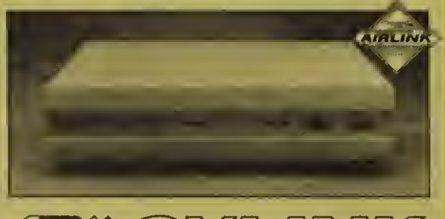

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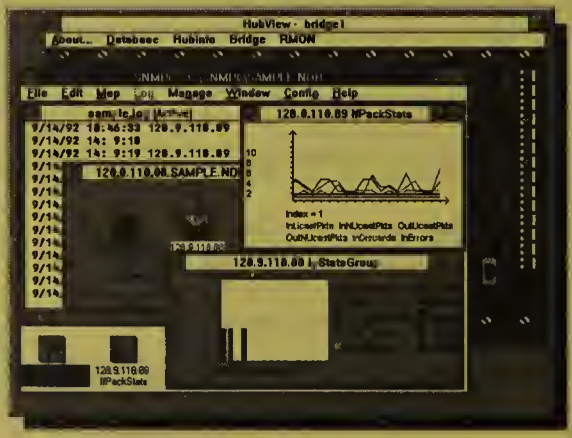
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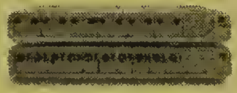

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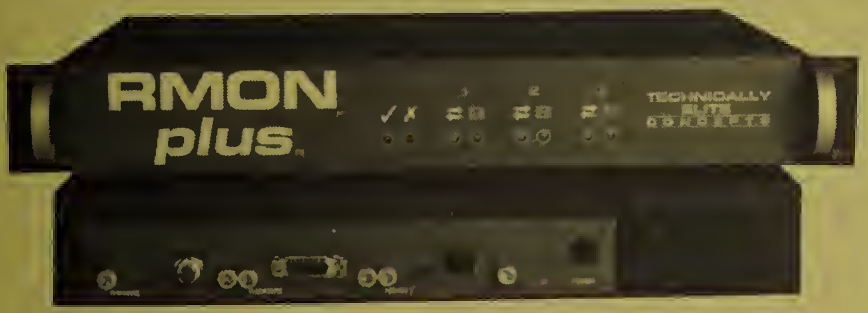

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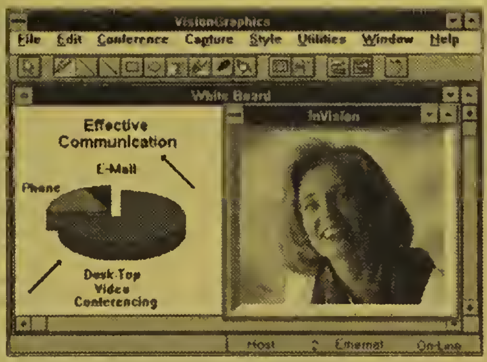

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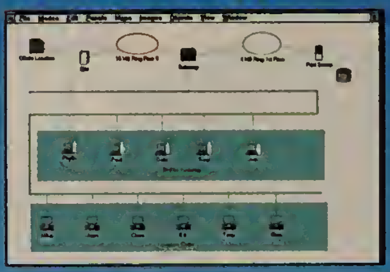
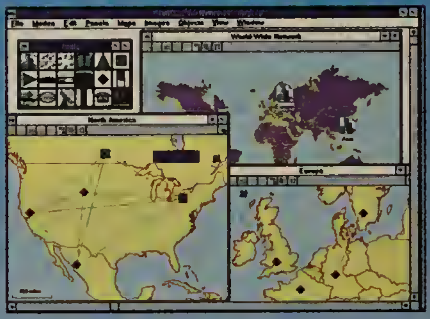


MANs – Plot cellular locations

WANs – Track and price circuits



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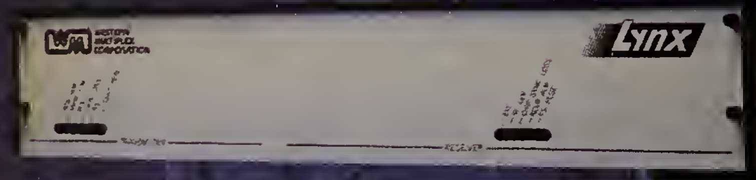

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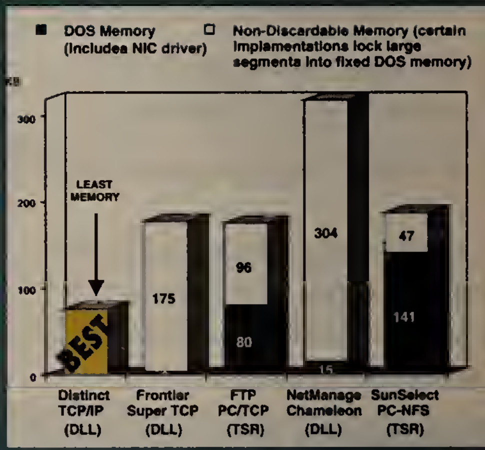

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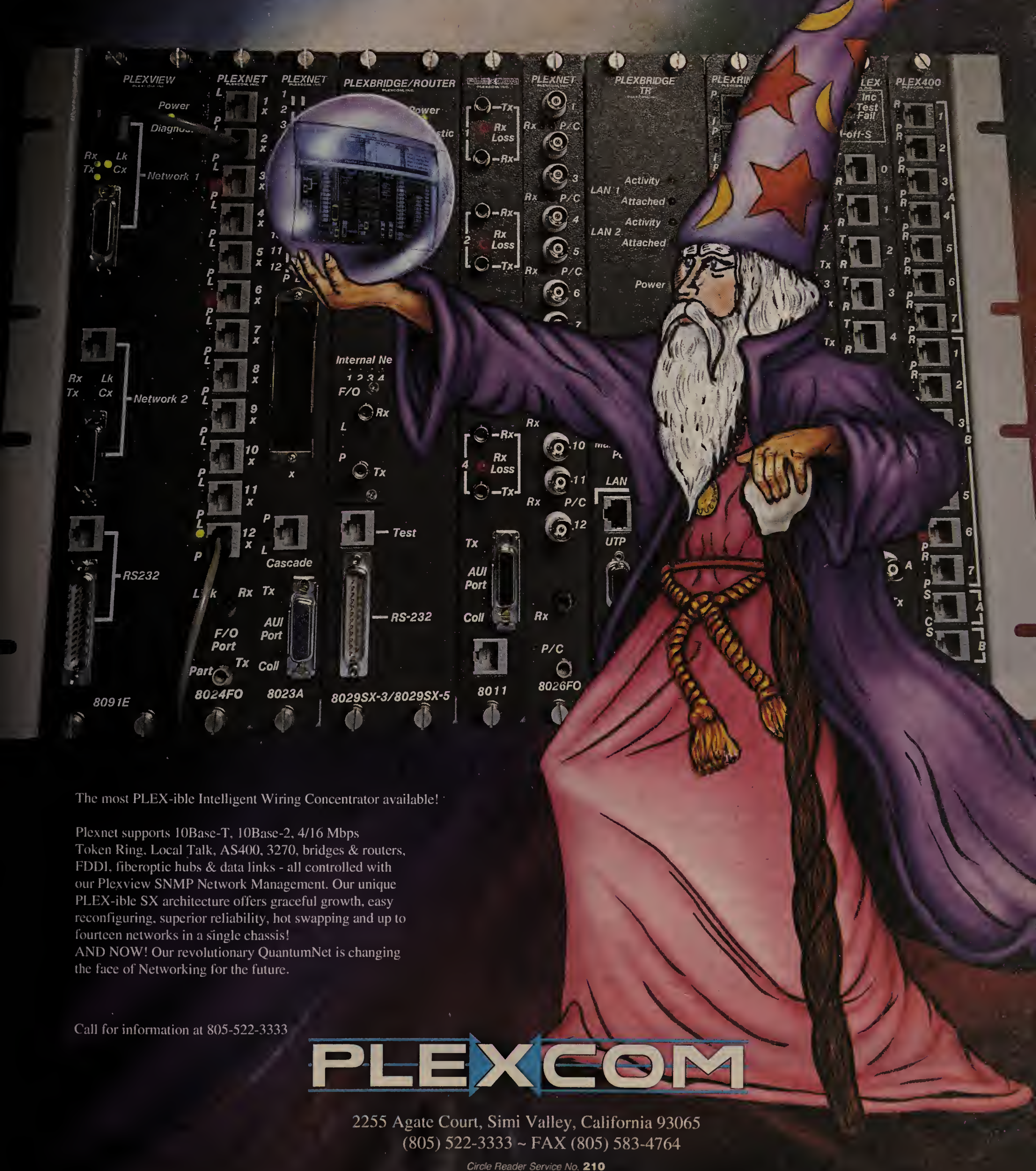

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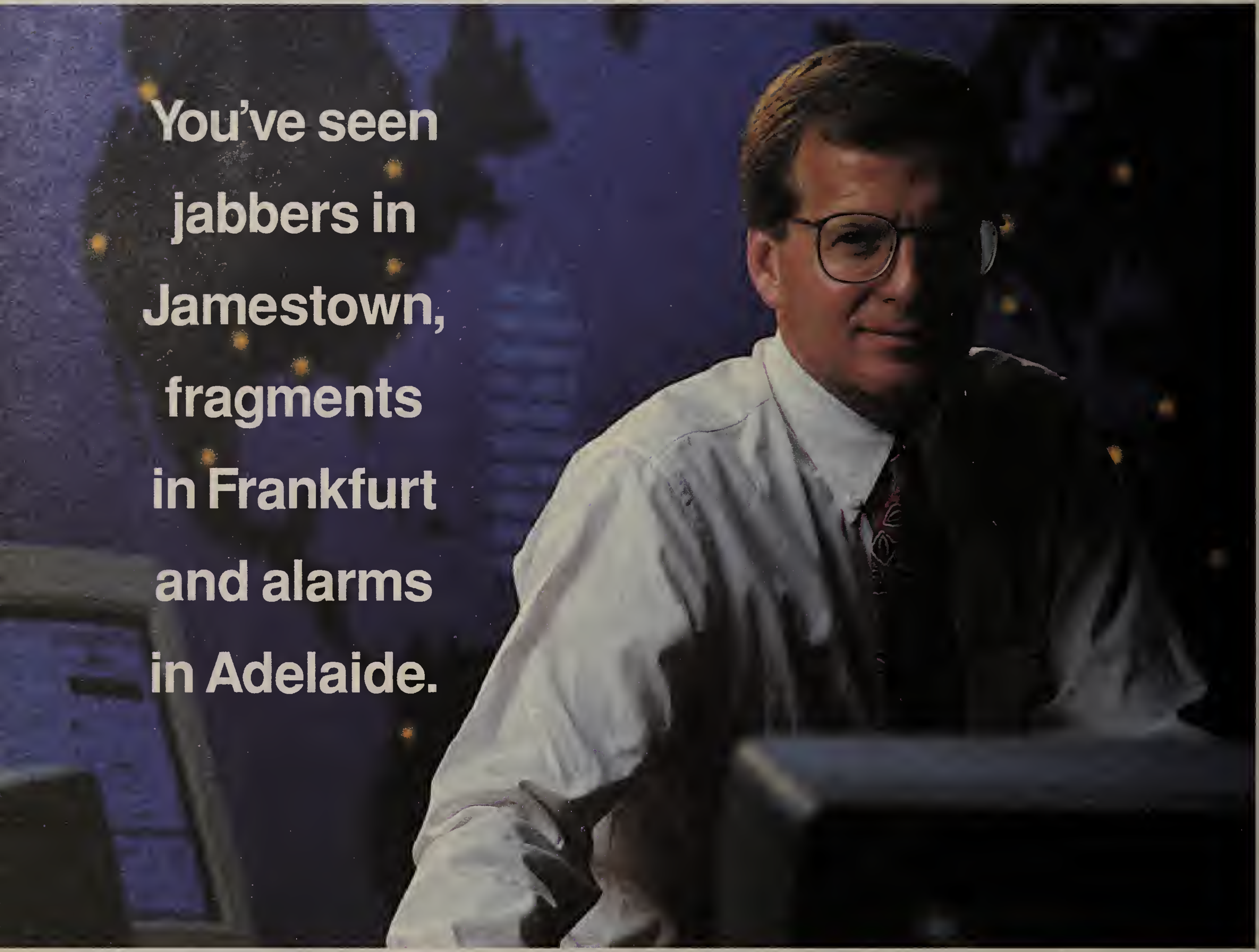

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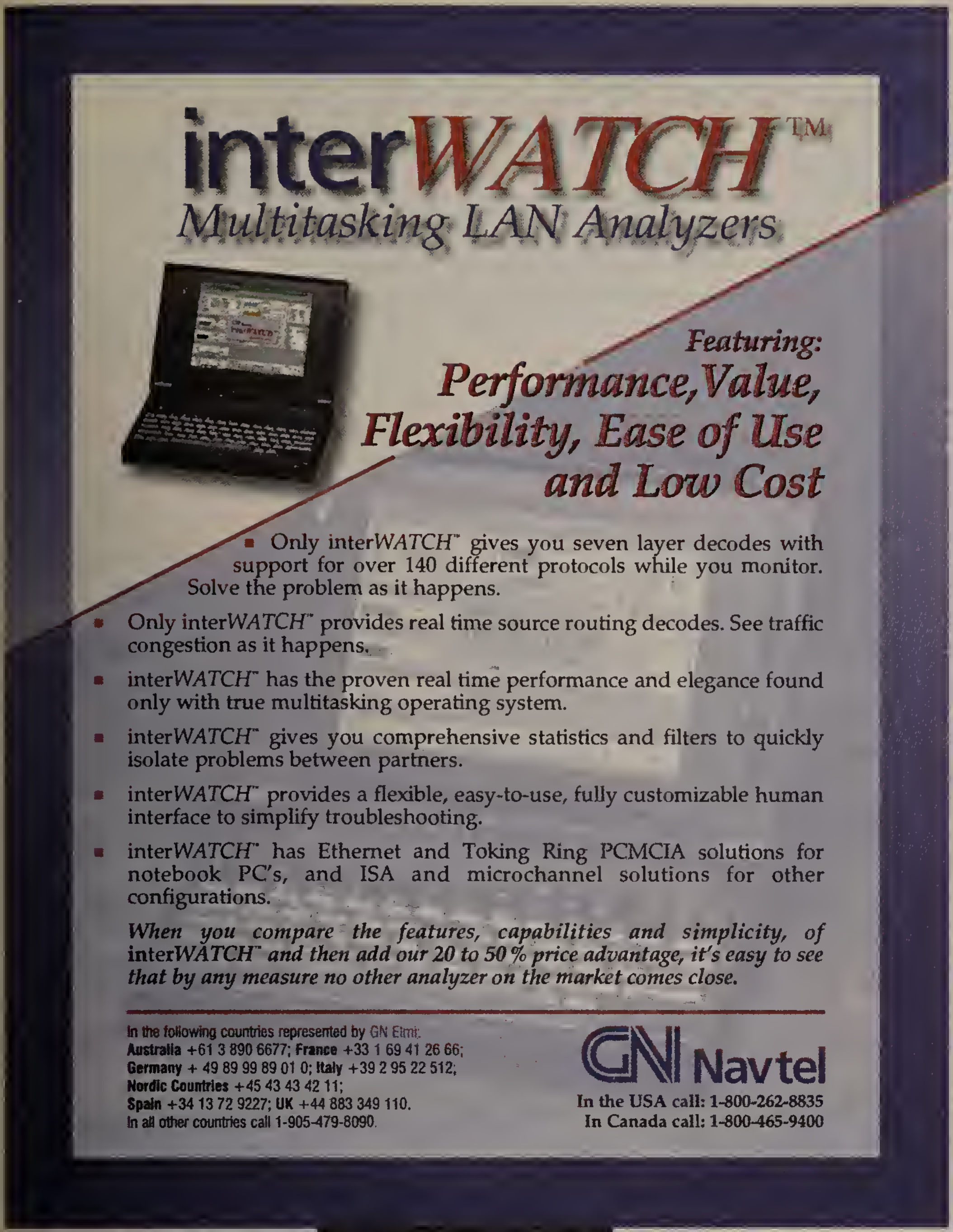

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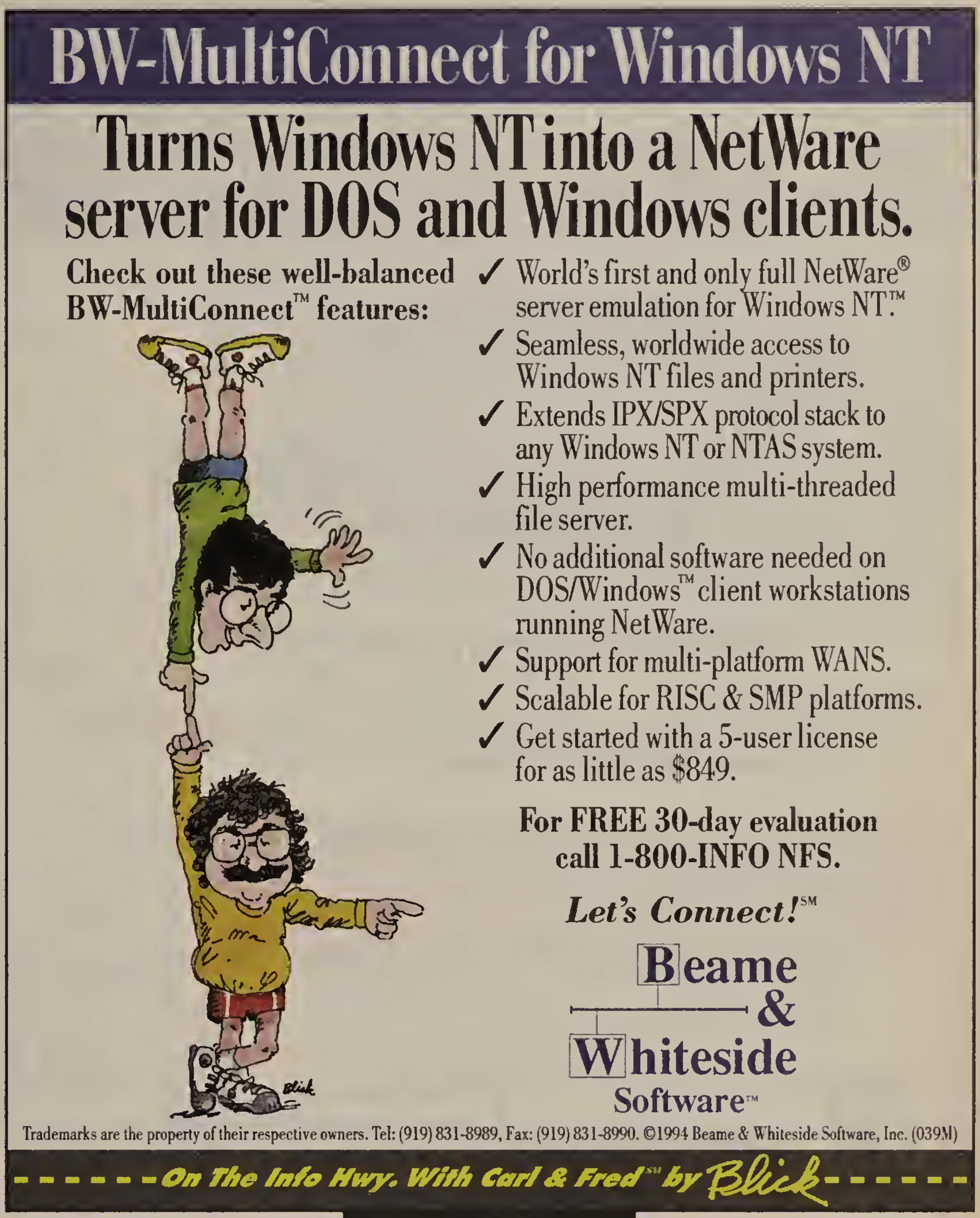

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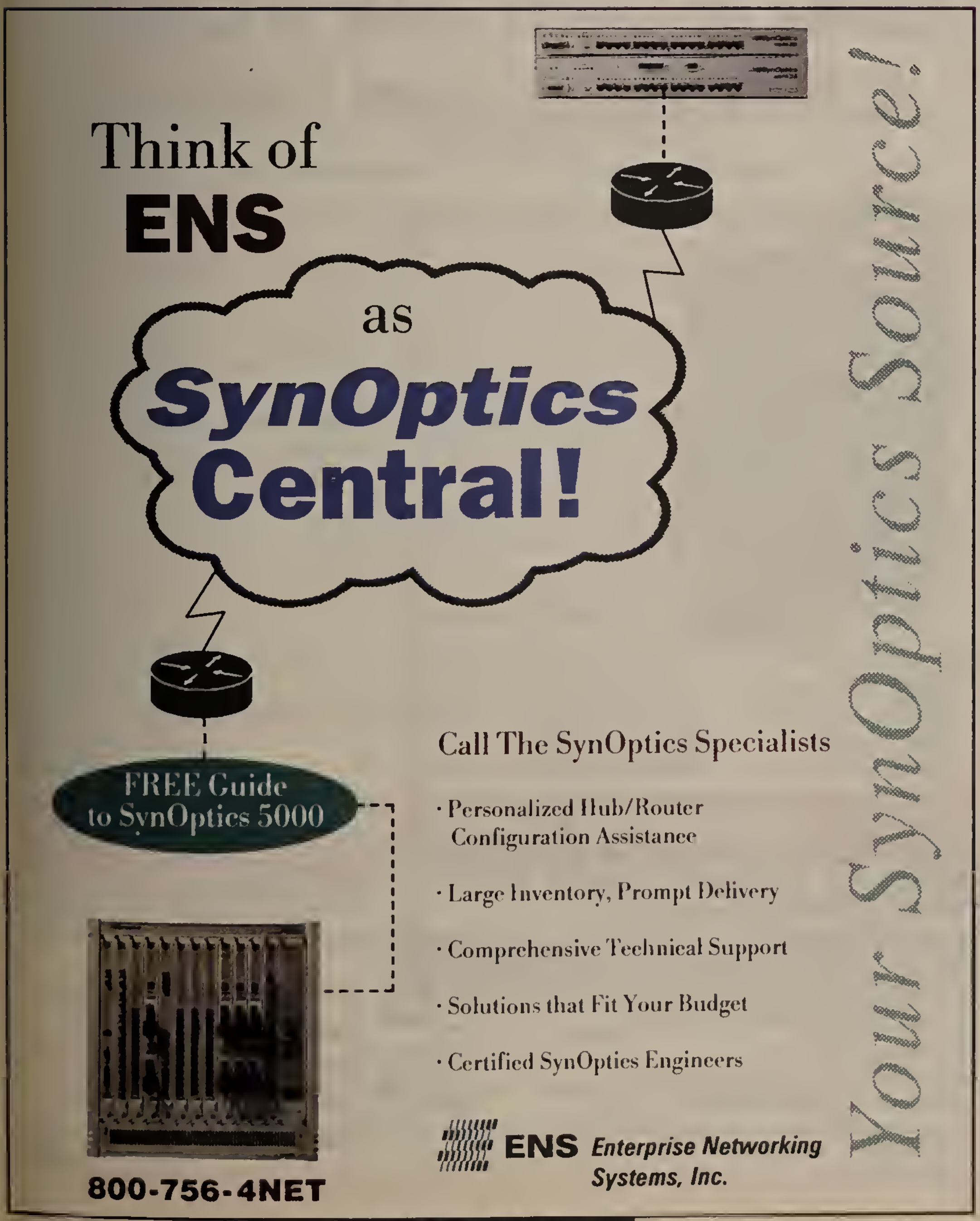

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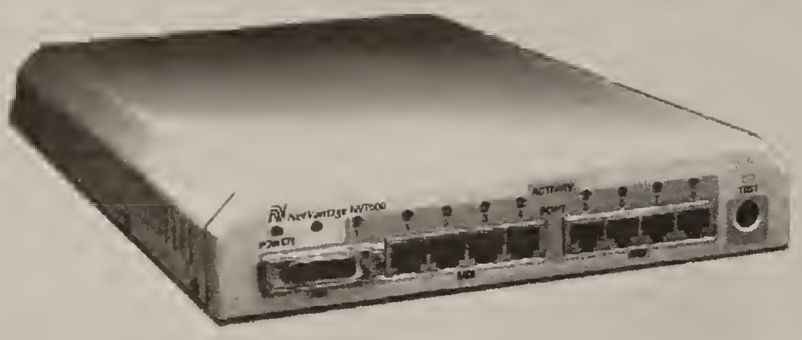

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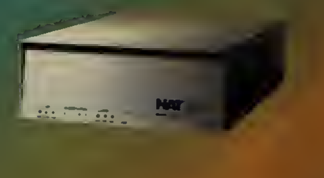

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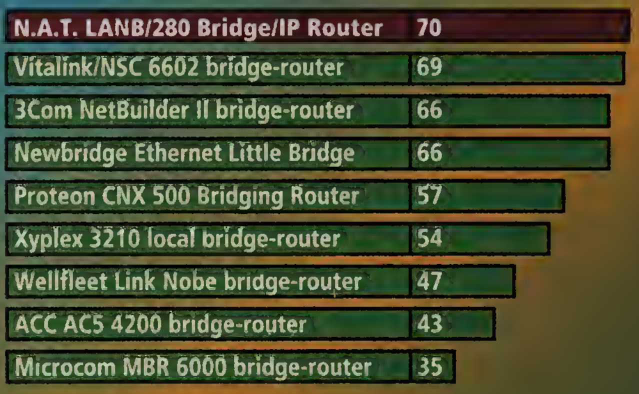

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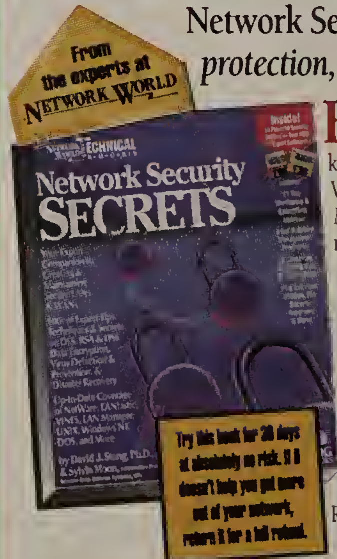
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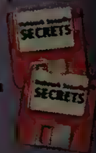

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NetView

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devices on Transmission Control Protocol/Internet Protocol and Systems Network Architecture networks.

According to Bruce Hillsberg, product manager for IBM's workgroup management offerings, Multisystem Manager will be able to pick up LAN Server- and OS/2-based device information in the future.

The objects in RODM can represent anything from computers and data links to LAN segments or whole workgroups. Once captured in RODM, data is displayed and automatically updated on the Graphics Monitor Facility (GMF), NetView's color graphics monitor.

"With Multisystem Manager, NetView users will be able to command and control any sort of distributed environment from NetView in a central location," Hillsberg said.

Today, users have to enter device definitions to RODM manually.

"Loading the RODM database has been a bear, so solving that problem with Multisystem Manager is a giant leap forward," said Ellis Gregory, president of NetTech, Inc. a net management software developer in Raleigh, N.C. Gregory is a former IBM NetView developer.

He said IBM has to quickly take the next step and make the LAN information in RODM available to existing IBM automation products such as Automated Operations Network/MVS, which allows users to automate responses to net problems such as link failures.

Hillsberg said IBM was working on such applications but declined to detail them.

On the LAN NetView front, IBM said it will unveil by midyear a variety of enhancements that will not only improve its performance, but let it monitor and control more devices. LAN NetView is IBM's OS/2-based net and systems management platform for managing OS/2-, Windows- and DOS-based personal computers on a LAN Server or NetWare LAN.

"The new release will take up less memory on the managing and client platforms, and consequently, the platform will operate faster," said Gale Meyer, IBM's manager of AIX network management services. "Ultimately, we want to make LAN NetView and NetView/6000 functionally equivalent, and users can choose to run them on the [Reduced Instruction Set Computing]- or Intel-based platform of their choosing."

Jeanette Lee, a developer within the LAN NetView group, said the firm will soon unveil a new release of LAN NetView that will be able to issue commands to remote devices using the Simple Network Management Protocol. LAN NetView can monitor SNMP devices today, but it cannot control them.

IBM's Sanjiv Ahuja

Other enhancements will improve LAN NetView's ability to gather device information such as hardware configuration data.

IBM's SNMP-based NetView/6000 management platform will also see some new battle gear.

As reported, NetView/6000 Version 3 will include support for additional databases and a hot backup facility that will allow one NetView/6000 platform to automatically back up another in case of failure (*NW*, April 11, page 8).

Last week, IBM disclosed a few more details. Sanjiv Ahuja, director of IBM's enterprise management platforms, said the firm was working on a new data modeling facility that would give NetView/6000 support for any database a user chooses, as opposed to only the Ingres database offered today.

"We are completely decoupling the database function from the net management platform," he said. " He did not announce a timetable for this function.

"IBM had to do something, anything, to get away from the NetView/6000's existing database," said Jill Huntington-Lee, an analyst with the Brandywine Network Associates consultancy in Cinnaminson, N.J. "It is too slow and doesn't scale up well." ☒

Debate

Continued from page 1

"Based on the intelligence in the network now, there are multiple ways of finding [SNA management] information without a hierarchical system like NetView," said Ellis Gregory of NetTech, Inc., a maker of SNA management software that works with Simple Network Management Protocol consoles such as Hewlett-Packard Co.'s OpenView and NetView/6000.

But opponents say some NetView functions cannot be duplicated because NetView is tightly coupled with IBM's MVS operating system, VTAM network control software and other host systems.

"NetView provides functionality these other products just don't have, one of the biggest being automation," said Bruce Hillsberg, product manager for workgroup management offerings at IBM. "Any customer who bets the business on an SNA network depends on automation to keep service levels up and keep that network running. These other products are more for monitoring, meaning an operator has to be there."

"I cannot see how they can provide System Network Interconnection alias translation unless they run on the mainframe," according to Eddie Rabinovitch, systems consultant at Dreyfus Corp. in Jersey City, N.J. "[Workstation-based alternatives] can take over some functions, but I don't think they can take the full functionality of NetView."

SNI allows users to connect to different SNA domains even if logical unit names in one domain are duplicated in another. NetView allows users to issue aliases to logical units if they are exchanging data with similarly named logical units in another SNA domain.

Rabinovitch's concerns were prompted by a recent announcement from Peregrine Systems, Inc., developer of OpenSNA, an SNA management package that runs under OpenView and NetView/6000. Peregrine rolled out Session ReCap, an OpenSNA enhancement that allows users to troubleshoot 3270 sessions through session traces.

DOWNSIZING?

Analysts hailed Peregrine's announcement as an inducement for SNA shops to downsize management of their nets to OpenSNA.

Not so fast, said Rabinovitch. In addition to SNI alias translation, it would be difficult to replicate such NetView functions as systems, network and application automation routines, and remote software loads for cluster controllers.

Rabinovitch said SNA users have invested a lot of time and money in customizing NetView, and it would be impractical — though not impossible — to reprogram these tasks for a workstation environment.

"It depends on what you're trying to do with NetView," said Wayne Bowker, advanced analyst for 3M Co. in St. Paul, Minn. "If you're using session trace facilities or a lot of CLIST or REXX files for automation, it's going to be hard to replace NetView. If you're a small shop and you want to activate resources, get some messages from VTAM and control VTAM resources — then [NetView] could be replaced."

Eric Olinger, product author at Peregrine, acknowledges that precise duplication of NetView functionality cannot be achieved. But NetView does not provide everything a user needs, either.

Olinger said there are SNA users who do not use NetView because of its cost or complexity. For them, OpenSNA is more affordable and easier to employ.

He admits that Peregrine doesn't have any customers that have pulled the plug on NetView, nor is that to be expected. Users are looking to retain their 10-year investments in NetView while using a product such as OpenSNA to monitor their SNA environment alongside their LAN internet.

And Peregrine has no plans to address some NetView functions, such as localized systems management and automation.

"Some of the systems automation stuff that NetView does may be done by other applications that run on, say, OpenView," said David Passmore, president of Decisis, Inc., a Herndon, Va., consultancy. "So there are other ways of filling that hole."

But don't throw away that mainframe just yet.

"It's very unrealistic to say the mainframe is not to be used because large networks need a good place to store things," said Tom Burkardt, director of IBM connectivity products for Cabletron Systems, Inc., which markets BlueVision, an SNA manager for its Spectrum management platform. "If users don't want NetView because of the CPU burden, we will remove it and issue management commands directly into VTAM. Our idea is to [let users decide] how they want to use the mainframe and Unix workstations." ☒

A sampling of LAN-based SNA managers

Peregrine's OpenSNA — Runs on HP's OpenView and IBM's NetView/6000. Works with VTAM to provide real-time network status reports; provides automatic discovery and display of network devices, connections, applications and configurations; supports command execution using non-VTAM syntaxes, 3270 session traces and optional interfaces to NetView utilities.

NetTech's EView — Runs on AT&T's StarSentry, NetView/6000 and OpenView. Gathers names and locations of SNA and token-ring devices, and correlates data; provides real-time status on SNA net from SNMP console graphical user interface; provides scripting language for automated response to alerts.

Cabletron's BlueVision — Runs on Cabletron's Spectrum. Has the same capabilities as NetTech's EView but works with NetView instead of directly interacting with VTAM. NetView-independent version now under development.

IBM's AIX SNA Manager/6000 — Runs on NetView/6000. Works with and depends on host NetView, and maps topology and monitors status of SNA networks.

HP

Continued from page 6

users supported by different cards.

The device will support up to 16 Ethernet, token-ring, 100VG-AnyLAN or Fiber Distributed Data Interface LAN interfaces. It will also support a host of network protocols, including the Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange (IPX), AppleTalk, DECnet and Xerox Network Systems.

The 650 will provide as many as 16 WAN ports and support a range of WAN services at speeds up to 2.048M bit/sec. Services supported include X.25, frame relay, leased lines, dial-up connections, Switched Multimegabit Digital Service and Integrated Services Digital Network links.

The Routing Information Protocol and Open Shortest Path First routing protocols will be supported, as will the bridging Spanning Tree Protocol. According to HP, the device will offer filtering and forwarding rates of 100,000 packet/sec based on 64-byte packets.

The 650 and the majority of its interface modules will be available in August. The router will cost $7,995; modules will cost from $1,495 to $6,495.

100VG-ANYLAN PRODUCTS

Meanwhile, HP will will roll out the industry's first products based on the 100VG-AnyLAN specification, which HP fought so hard to have accepted.

The products consist of the AdvanceStack 100VG Hub-15, a 15-port hub that supports the emerging IEEE 802.12 standard, as well as 100VG Adapter Cards that run at either 10M or 100M bit/sec for Industry Standard Architecture (ISA)- and Extended ISA-based personal computers and workstations.

The products are based on the HP-developed Demand Priority signaling scheme, which requires use of all four wire pairs in Category 3, 4 or 5 unshielded twisted-pair wiring. Since Ethernet's collision-detection feature is not used, 100VG-AnyLAN can be optimized for multimedia applications by letting users allocate bandwidth as needed.

In the hub's initial release, HP will offer the 100VG Bridge/SNMP Module. This will provide Simple Network Management Protocol capabilities and a speed-matching bridge function that will let users connect the 100VG Hub-15 to 10M bit/sec Ethernet hubs.

The adapters will have two RJ-45 connections — one for 10M bit/sec Ethernet and one for 100VG-AnyLAN Ethernet. In the first release this summer, users will have to manually switch between the two network speeds; a software-switching mechanism will be added in a future version.

The hub will cost $3,750; the bridge/SNMP module will cost $1,495; and the ISA and EISA LAN adapters will cost $399 and $599, respectively.

Token ring-based 100VG-AnyLAN products are expected from HP in early 1995.

☎HP: (800) 533-1333.

FlowMark application to be feature-packed

IBM scrambled to add features demanded by beta testers for its FlowMark work flow management application and will release a production version of the product next month that is much more robust than the company had originally planned.

For example, IBM pushed up its development timetable to enable the first version of FlowMark to run across multiple servers, according to Dick Sullivan, director of workgroup solutions for IBM's Software Solutions Division in Somers, N.Y.

The beta version of FlowMark could run only on a single server, a major problem for beta-test site Royal Bank, which has four data centers, 1,500 branches and 48,000 end users spread across Canada.

Geoff Lancaster, manager of workbench planning and development at Royal Bank in Toronto, also wanted FlowMark to run on Unix and urged IBM to provide an MVS server version to run on the bank's mainframes.

IBM is responding by including in the initial FlowMark release a client version for MVS that lets users on 3270 terminals access OS/2-based FlowMark servers.

IBM has no plans to develop an MVS server version of the product, according to Sullivan. But FlowMark can access mainframe data and launch legacy applications running on MVS for users who need to view them from within FlowMark objects created on the mainframe, he explained.

In addition, Big Blue plans to ship versions of FlowMark for Windows clients and AIX servers in the fourth quarter, Sullivan said. The company will also port FlowMark to Unix platforms from Sun Microsystems, Inc. and Hewlett-Packard Co. if there is enough demand. IBM is also considering versions that would be compatible with Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT, he said.

The beta version was also missing many of the building blocks that enable FlowMark to share information and launch operations in other applications, according to Royal Bank officials.

But IBM has included in the first release application program interfaces (API) to applications such as Lotus Development Corp.'s Notes and cc:Mail, as well as IBM's VisualInfo image management product, its CICS transaction processing environment, and its Time and Place/2 group scheduling software.

The APIs are for specific commercial applications, however. Currently, there is no way for FlowMark to talk to internally developed applications such as a corporate directory, an important link in Royal Bank's enterprise work flow picture, said Mike Velshi, vice president of technical planning and development for Royal Bank.

FlowMark will come in three pieces: a $12,000 server; an $800 per-seat Buildtime client that developers use to model processes and systems administration; and a $200 per-seat Runtime client, which executes work flow processes at the desktop.

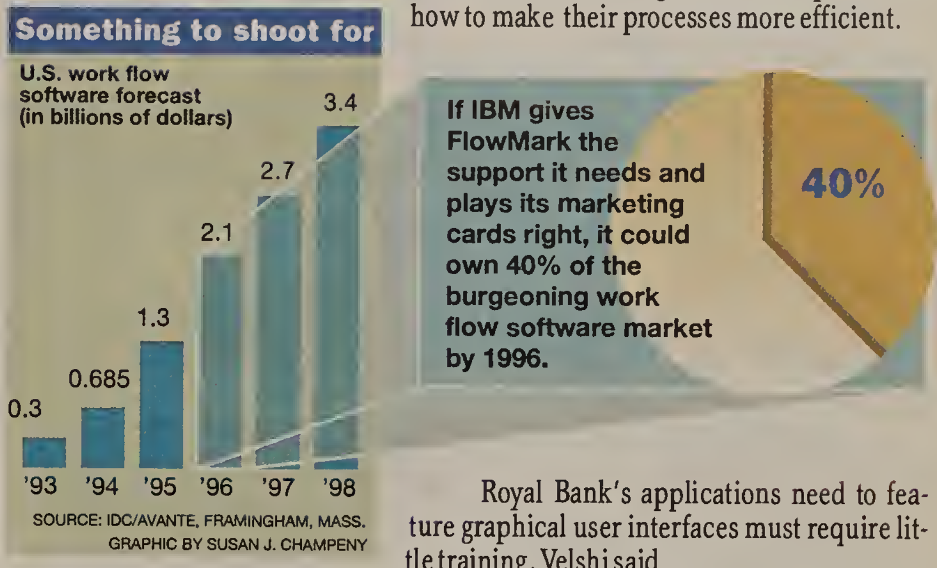
BY KEVIN FOGARTY

Royal

Continued from page 1

production release of the object-oriented work flow management system, which is expected to be announced May 13 (see story, this page).

FlowMark, which will initially run on IBM OS/2 clients and servers, will let users define and automate business processes using existing client/server and host-based applications. It will also let users put strict process controls on vital areas of business and include a feedback loop so managers can monitor the company's activity.



SOURCE: IDC/AVANTE, FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

One of Royal Bank's major concerns during FlowMark's beta test was the amount of processing power required by the software. When FlowMark runs on an IBM Personal System/2 Model 90 33-MHz server, there is no room for any other application on that server.

"We'd like to see [IBM] work on making [FlowMark] a little less resource-intensive and perform a bit better," said Geoff Lancaster, manager of workbench planning and development for Royal Bank. "Ultimately, what you'd want to do is have it run on the servers that are out there and not have to install a server just for a work flow process."

Help is on the way, said Dick Sullivan, director of workgroup solutions for IBM's Software Solutions Division in Somers, N.Y. The production version of FlowMark calls for only half of the processing power needed for the beta version of FlowMark, he said.

Although the amount of power needed depends on the number of process models and users, a server with 32M bytes of memory should be able to run FlowMark and have room to spare for another application, Sullivan added.

Royal Bank is considering FlowMark as one tool to make it easier to modify the bank's highly structured work flow without giving up security checkbacks or monitoring capabilities. The bank tested FlowMark by using it to create a logical work flow model that it could compare to existing operations, such as mortgage approval.

Royal Bank enrolled as a beta site mainly to help tailor FlowMark's development to the bank's future needs, Lancaster said.

The bank is still evaluating the product but not actively using it, he added.

Lancaster's division wrote a work flow model for a credit application group at the bank. He then demonstrated the model to other managers to see if they could use it and whether it gave them any ideas on how to make their processes more efficient.

Royal Bank's applications need to feature graphical user interfaces must require little training, Velshi said.

Although IBM has added many of the features and functions Royal Bank was looking for, the process has seemed rushed to Lancaster. "As far as I'm concerned, we're still in an early-install program," he said.

"I wouldn't be comfortable putting it in a production situation."

But IBM's Sullivan said the new features are stable and ready for the general release of the product.

Comments?

See "Contacts" box on page 2.

NETWORK WORLD

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InterSpan

Continued from page 1

which installs and maintains AT&T frame relay services for outside customers.

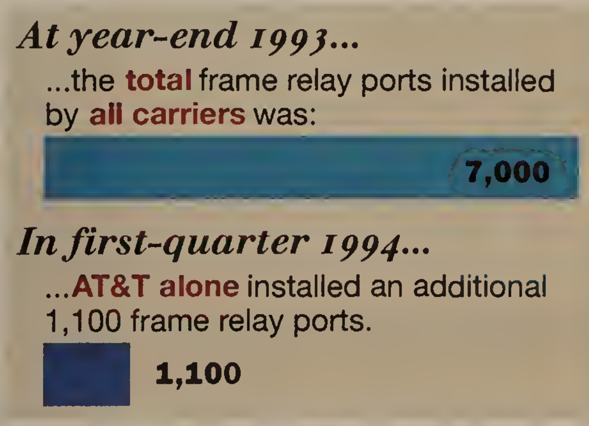
Perot discovered the problem when it began to bring customers up on the service.

"We had promised our customers that the cutover would be transparent, but users noticed the delay and were complaining," Smith said.

Perot expects to resume the cutovers on May 1, the date by which AT&T has promised to increase InterSpan network capacity in the area.

Most analysts said they have heard no complaints about InterSpan performance. But Perot tests comparing throughput across 256K bit/sec frame relay permanent virtual circuits with 56K bit/sec leased lines revealed that data was getting through three times faster over the lower speed links.

Smith said AT&T told him that approximately 10 other customers were experiencing a similar bottleneck. There have been "certain pockets of imbalance with some customers," the AT&T spokeswoman told *Network World.*



She said the company is informing new customers about the situation.

"We are telling them up-front that there is a network reengineering taking place, and we give them a date when we will be able to deliver service" in sync with the CIRs they demand, the spokeswoman said.

One reason for the bandwidth backlog is that AT&T gleaned the volume of business in the first quarter that it did not expect to see until the end of the year (see graphic). AT&T said it has experienced 30% or better growth each month since last October.

CIMI Corp., a Voorhees, N.J., consultancy, has pegged AT&T as the fastest growing frame relay provider in terms of ports and said the carrier needs to add ports to virtually all its service areas as well as new locations.

However, "the way AT&T built the network was a building-block method designed to minimize its investments in the technology in case it didn't take off," according to Joe Noel, who is the general manager for telecommunications services at IntelliQuest, Inc. in Houston.

"But having a capacity problem is a nice problem to have; it means people are buying your service," he said.

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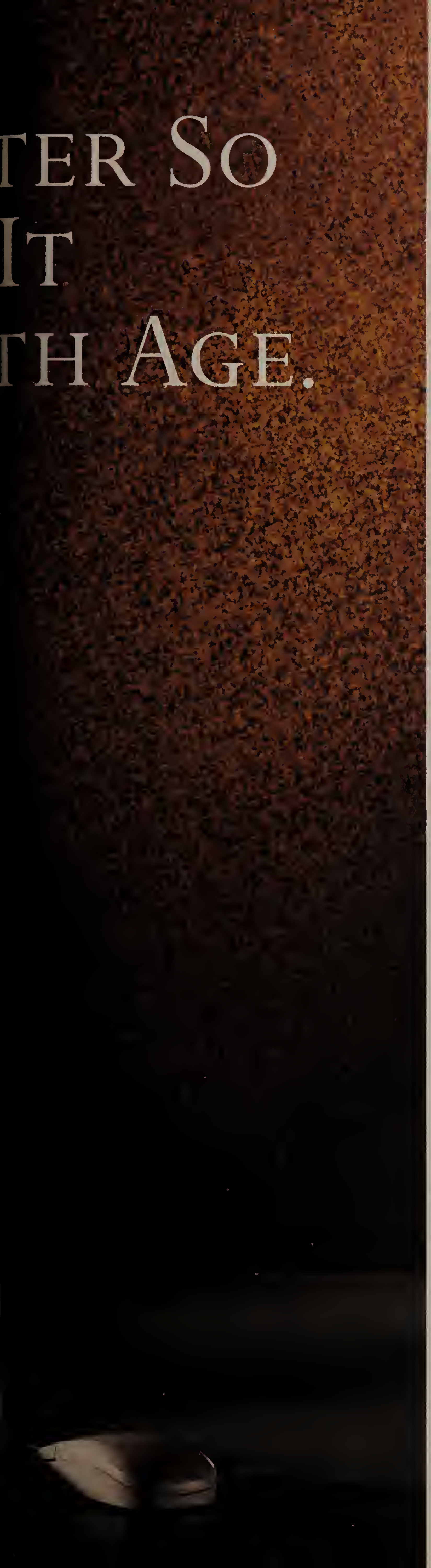

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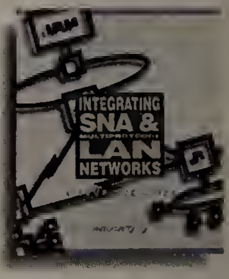

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